

NETWORK WORLD

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MCI unveils dedicated fax network

By Anita Taff
Senior Correspondent, Washington

NEW YORK — MCI Communications Corp. last week announced MCI FAX, a facsimile service provided over a dedicated digital network.

MCI said it has allocated a portion of its digital network to support the facsimile service and claimed it is the first dedicated network offered by a long-haul carrier for domestic and international transmission of facsimile messages.

Among the services to be supported by the MCI FAX network are transmission of messages from personal computers, terminals, telex and electronic mail systems to facsimile machines, as well as multipoint distribution of facsimiles. The network will also support facsimile store-and-forward capabilities and, in the future, will let users receive information from public data bases through a facsimile machine.

MCI will provide users with management reports detailing facsimile usage, net diagnostic services, and security and accounting capabilities. MCI will also support toll-free 800 calls to facsimile machines and allow customers using an MCI FAX
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PHOTO COURTESY OF UNION PACIFIC

Union Pacific's train tracking and dispatch center in Portland, Ore.

Networks put railroads on track to bigger profits

Union Pacific, Burlington Northern test control nets designed to increase traffic and cut costs.

By Paul Desmond
Staff Writer

OMAHA, Neb. — Union Pacific Railroad Co. and Burlington Northern Railroad Co. have installed prototype control networks that promise to help both companies boost their market share in an increasingly competitive industry.

The companies hope the networks will let them squeeze more trains onto their respective rail systems and provide for better fuel efficiency.

The railroads also expect the

networks to help them optimize scheduling to ensure freight cars are filled to capacity.

In addition, the networks will aid in the planning of track and locomotive maintenance by allowing the railroads to monitor performance.

Union Pacific expects its \$150 million control network to save it \$56 million to \$75 million per year, mostly in fuel costs. Burlington Northern estimated the savings at several hundred million dollars annually.
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BBN bolsters role of X.25 in SNA world

Firm to unwrap powerful host-end processor linking IBM devices in a packet-switched net.

By John Cox
Senior Editor

CAMBRIDGE, Mass. — BBN Communications Corp. is set to announce next week a high-speed communications processor that packages IBM Systems Network Architecture data for transport over X.25 packet networks.

The new T/100 Host-End Processor will let IBM SNA users exploit the inherent advantages of X.25 packet networks without relying on IBM's resource-intensive X.25 gateway products, analysts said. SNA hosts become, in effect, end nodes in a packet network.

BBN confirmed that it will make a product announcement Nov. 14, but it declined further comment.

According to analysts, the T/100 will function as an interface between one or more IBM front-end processors and BBN X.25 packet switches. The device eliminates the need to run IBM's NCP Packet Switch Interface (NPSI) software on the front end, freeing up front-end resources and providing for more efficient packet handling.

The product will make it possible to create what BBN calls a virtual domain.

The T/100 appears to attach front-end processors and their hosts as another SNA front-end and host arrangement. It manages all conversions between SNA and X.25 and insulates the IBM processors from the packet network.

As a result, network operators
(continued on page 49)

Vendor pull warps wire standard

By Rex Bowman
West Coast Correspondent

WASHINGTON, D.C. — The Electronic Industries Association's (EIA) effort to develop a standard for horizontal wiring within commercial buildings has yielded not one but three standards, which translates into no standard at all, critics charge.

In November 1985, the EIA formed the ad hoc subcommittee for Commercial Building Wiring Standards to develop standards for both horizontal and backbone wiring. Horizontal wiring is the wiring that links computing and communications equipment to a wire closet in a building wire scheme. Backbone wiring runs between wire closets.

A standard wiring system would allow users to wire buildings prior to purchasing equipment and to install new equipment without rewiring. A common wiring scheme would also support equipment from multiple vendors and allow for easy migration between different vendors' products.

Observers applauded the EIA subcommittee for drawing up standards for both copper and fiber backbone wiring. But they said subcommittee members bowed to pressure from IBM and Digital Equipment Corp. in deciding to support three options, rather than one specification, for horizontal wiring.

The subcommittee is composed predominantly of representatives of telephone compa-
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NETLINE



RBHCS TELL THE FCC that bypass is costing them hundreds of millions of dollars each year. Page 2.

THE BOSTON STOCK Exchange implements an advanced network designed to increase trading volume and revenue. Page 2.

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ALLEGING LIBEL and slander, GTE Florida files a countersuit against the Home Shopping Network. Page 49.

NMI EXPANDS ITS line of network management products with the acquisition of Contel ASC's Network Analysis Center. Page 50.

FEATURE

Purchasing alternatives get a new lease on life

Leasing is now a buyer's market, giving users the upper hand in large system acquisitions.

By Thomas Donovan
Special to Network World

There's good news for communications managers.

As recently as 1986, leasing private branch exchange equipment was a new idea, a change from predivestiture days when AT&T rented the equipment. Lessors, accustomed to providing leases for computers, wrote communications leases as a courtesy to the user. In most cases, these were full

payout-type leases, which meant the lessor recovered its entire investment through the lease without having to rely on future resale value.

But in today's market, in which the PBX is rapidly becoming more of a commodity item, the communications manager can command highly competitive proposals from suppliers. The obtainable discounts will lower the cost of the prod-
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MANAGEMENT
UPDATE

RBHCs cite massive losses to bypass in FCC filings

Carriers say they lose hundreds of millions annually to bypass of the switched network.

By Anita Taff
Senior Correspondent, Washington

WASHINGTON, D.C. — The regional Bell holding companies and GTE Service Corp. told the FCC last week they are losing hundreds of millions of dollars each year due to bypass of their switched networks.

In reports filed with the Federal Communications Commission, the seven RBHCs and GTE Service submitted data estimating the total revenue and minutes of network usage lost to bypass during 1988 and reasons cited by customers for bypassing the switched network.

The reports detailed both facility bypass, which occurs when users connect directly to an inter-exchange carrier or use private network facilities, and service bypass, which involves use of RBHC private-line facilities.

The carriers are required to file such reports on a semiannual basis as part of a bypass monitoring program established by the FCC and the Federal-State Joint Board, a group that includes FCC commissioners and state regulatory commissioners who discuss policy issues.

According to its report, Ameritech is the biggest loser with an

estimated revenue loss in 1988 of about \$864 million from both facility and service bypass. Bell Atlantic Corp. followed closely behind, reporting combined losses of \$832 for the year.

Nynex Corp., Pacific Telesis Group, Southwestern Bell Corp. and US West, Inc. estimated their annual losses from both types of bypass in the range of \$300 million to \$400 million. BellSouth Corp. reported the smallest loss, estimating losses of \$257 million in total bypass annually. GTE Service, which serves a number of sites in different regions of the country, reported annual losses due to bypass of \$291 million.

In RBHC reports filed in April, which covered bypass levels during 1987, Bell Atlantic reported the highest total bypass losses at \$888 million, with Ameritech close behind at \$840 million. The other RBHCs had total losses in the \$300 million to \$400 million range, similar to the reports filed last week. Overall, three RBHCs reported that losses from bypass increased since 1987, and four reported a decline in losses from bypass.

Although the RBHCs say they have demonstrated that bypass is

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New trading net in place at Boston Stock Exchange

Automated system to increase trading volume.

By Jim Brown
New Products Editor

BOSTON — The Boston Stock Exchange, Inc. recently cut over a \$3 million automated trading network designed to encourage its 153 member brokerage firms to increase the number of stock trades executed on its exchange floor.

The Beacon trading network is a key component of the Boston Stock Exchange's stepped up effort to compete for business against the six other regional stock exchanges, including the New York Stock Exchange, Inc., where 75% of all daily U.S. trades are executed.

The present competitive environment was kindled in the mid-1970s when stock exchanges were deregulated and brokers were left free to buy stocks from the exchange offering the best price.

In addition to providing links between stock traders on the Boston floor, the new Beacon trading network supports links to trade order-entry systems at brokerage firms and to stock quotation services.

These links enable the members to ensure investors that stock prices traded here will be lower than on other regional exchanges.

Currently, 116 of the 1,667 stocks traded on the Boston floor are available only through this exchange.

Beacon is designed to execute trades faster than traditional methods, enabling traders to take advantage of a price that could change before a paper-based transaction is completed. It also obviates the need to manually enter transaction records into a number of different trade-reporting systems, such as clearing and settlement systems.

In addition, Beacon will enable the Boston Stock Exchange to better handle unusually heavy transaction loads similar to those registered on Oct. 19, 1987, now called Black Monday, when the exchange handled three times the usual number of trades.

Because large brokerage firms typically belong to each regional exchange, they can trade anywhere they choose.

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Briefs

On a roll. Hughes Network Systems, Inc. has won a pair of contracts for very small aperture terminal networks that could be worth as much as \$38 million.

Last week, Hughes Network Systems, a Germantown, Md.-based subsidiary of Hughes Aircraft Co., announced a five-year agreement to supply GE Information Services with a VSAT network worth up to \$8 million.

GE Information Services plans to use the VSATs in its data communications network.

A week earlier, the company won a \$30 million contract with Edward D. Jones & Co. that calls for Hughes to install a network hub at Jones' headquarters and up to 2,000 VSATs at facilities throughout the U.S.

Hughes Network Systems also recently won a contract from Chrysler Corp. for a 6,000-node VSAT network ("Chrysler bets on VSAT net to win edge, speed repairs," *NW*, Oct. 31). Neither party would disclose the value of that contract.

NARUC notes. At the 100th annual conference of the National Association of Regulatory Utility Commissioners (NARUC) in San Francisco last week, the NARUC's Committee on Communications agreed to appoint a task force to work with the Federal Communications Commission in ironing out concerns about the regulation of enhanced services provided under Open Network Architecture (ONA).

Several state public utility commissions have filed suit against the FCC over whether state regulatory agencies or the FCC will oversee the ONA plan.

The states contend that most enhanced services

will be provided on an intra-local access and transport area basis and should be subject to state regulation.

The NARUC is siding with the states in their legal battle with the FCC, and the Committee on Communications' decision to work with the FCC does not mean the NARUC has changed its position, according to committee members.

You're no Fowler. Federal Communications Commission Chairman Dennis Patrick, addressing the National Association of Regulatory Utility Commissioners convention last week, said, "A moment ago, I had a disconcerting experience. I introduced myself to a state commissioner I had not met before. I noted that my philosophy was similar, at least in broad terms, to that of former FCC chairman Mark Fowler. The state commissioner eyed me rather coolly. Then he said, 'You know, I knew Mark Fowler. He was a friend of mine. And Dennis, you're no Mark Fowler.'"

Packet linkup. McDonnell Douglas Network Systems Co. last week announced that its Tymnet packet-switched network can now be accessed through Nynex Corp. packet network services. The agreement promises to enhance Nynex's ability to deliver packet data traffic to New York's financial services community.

Users of Nynex's Infopath in New York and InfoLook Gateway Service in Vermont will be able to access Tymnet through New York Telephone Co. or New England Telephone & Telegraph Co. concentration points.

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NARUC sees a need for AOS rules

By Rex Bowman
West Coast Correspondent

SAN FRANCISCO — Due to numerous consumer complaints about alternative operator service (AOS) companies, the National Association of Regulatory Utility Commissioners (NARUC) last week urged state regulators to impose a series of stringent guidelines on AOS providers.

At the 100th NARUC Annual Convention here, representatives from the Federal Communications Commission, the AOS industry and the NARUC discussed with hundreds of state utility commissioners the ways each group is dealing with the problem.

While the FCC claimed to be developing a policy that will not stifle competition with over-regulation, and the AOS industry said it is trying to police itself, the NARUC's Committee on Communications is the only group to put policy guidelines on paper.

In July, the committee passed a resolution recommending that utility commissions around the country adopt a set of eight guidelines regulating AOS companies. The resolution also calls for federal enforcement of three of those guidelines, including one that would give customers detailed complaint procedures and require that customers be told they are using an AOS.

"Each state must decide its own direction based on its own needs, political environment and economic conditions," said William Long, chairman of the Michigan Public Service Commission.

AOS companies provide operator services for 0+ calls and target those services at large institutions such as universities, hotels and hospitals, as well as establishments with non-Bell pay telephones. The companies offer such customers a commission on operator-assisted calls from their facilities.

But AOS companies have been criticized by those who use their services. Complaints of excessive or unpredictable charges, long delays in getting connections and billing inaccuracies have plagued the industry since its inception about three years ago.

According to Greg Vogt, chief of the enforcement division of the FCC's Common Carrier Bureau, the FCC has received more than 1,000 complaints about AOS companies since January. The FCC is currently assessing formal complaints filed by two consumer action groups against five AOS companies.

Meanwhile, state regulatory commissions have issued public warnings about AOS companies and launched investigations into their operations.

The NARUC Communications Committee's recommendations represent the first coordinated effort by the states to get control over AOS companies.

Specifically, the committee recommended that:

- States certify AOS companies to operate within their boundaries only after the companies have shown the technical and financial capabilities needed to support proposed service offerings and have demonstrated that their services are in the public interest.

- All emergency 0+ calls be routed over the fastest path to the local emergency service provider.

- Public utility commissions regulate an AOS companies' rate levels. Also, if the AOS company's customer is not an end user (as in the case of a hotel or university),

Complaints of inaccuracies have plagued the industry since its inception.

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the committee recommended that the AOS company's rates not exceed the rate of the local exchange carrier or dominant interexchange carrier.

- AOS providers post the company name and complaint procedures, announce to the caller the name of the AOS company handling the call, quote rates upon request and display information telling the caller how to reach the local exchange operator.

- Public utilities require all billing to the caller to be limited to the authorized rates.

- AOS companies meet established state and national guidelines dealing with operator response and call processing time.

- AOS companies, federal and state regulatory agencies, and, where necessary, local exchange carriers work together to resolve problems.

- When callers request to be switched to a local exchange or interexchange carrier's operator, they should be billed from the point where they made the call, not from the point where the carrier picks it up.

Dennis Thomas, a director of International Telecharge, Inc., a Dallas-based AOS company, told the group his company has developed a "code of responsibility" that resembles the NARUC's recommendations. Paul Gamberg, president of the Operator Service Providers of America (OSPA), formed in April, said OSPA will announce a similar code for its members later this year.

"The AOS industry does not oppose regulation," Thomas said. "In fact, a little regulation will help to discipline the industry." ▢

Presentation Mgr. to ease applications portability

By Barton Crockett
Senior Writer

NEW YORK — IBM last week unveiled its heralded Presentation Manager graphical interface, which promises to make it easier for users to work with software running across a range of processors.

Presentation Manager was delivered as part of OS/2 Standard Edition 1.1, which IBM codeveloped with Microsoft Corp. of Redmond, Wash. The company said at a press conference here that it has begun shipping OS/2 Standard Edition 1.1.

IBM has pledged that all its major operating systems and application software will support the Presentation Manager interface as part of Systems Application Architecture, the company's scheme for providing application portability across its processors.

Interfaces ease use

According to some observers, other vendors will adapt Presentation Manager-like user interfaces.

Presentation Manager features icons and window displays that let users open files and manipulate information by pointing and clicking a mouse device.

"One of the biggest impediments to using applications on computers from different manu-

facturers is that users have to learn different interfaces," commented Larry Day, manager of technology integration and consulting services at Hughes Aircraft Co. in Long Beach, Calif. "A common interface would facilitate interconnectivity."

Hewlett-Packard Co. announced that it is developing, with Microsoft, a graphical interface with the same look and feel as Presentation Manager. The interface will be dubbed Common X Interface. It is expected to be introduced at a press conference on Nov. 16, an HP spokesman confirmed.

Additionally, Santa Clara, Calif.-based 3Com Corp. said it plans to ship in the first quarter of next year a local network management product called 3+ Open LAN View that uses IBM's Presentation Manager.

A 3Com spokesman said the graphical interface makes it easier for a technician to access and work with network performance data.

An IBM spokesman added that several other companies will announce support for the interface at Comdex/Fall next week, including local-area network makers Ungermann-Bass, Inc. and Novell, Inc.

Users and analysts differ on how long they believe it will take

for products based on the standard to proliferate.

"I suspect in about two to four years this common user access will really catch on in the industry," Day said. "Computer makers and software companies will need it to sell products."

Donald Czubek, president of Saratoga, Calif.-based consulting firm Gen2 Ventures was less optimistic, however.

"Presentation Manager will only be important over the very, very long term," he said.

Czubek argued that the massive programming effort needed to provide Presentation Manager-like interfaces in other types of software will slow its acceptance. Unless application makers support the standard, a user would only use Presentation Manager when working with the operating system to call up programs.

Other challenges

IBM also faces a daunting task in enhancing its other operating systems to support the interface.

"Sure, someday most software companies will support IBM's Presentation Manager," Czubek said, "but it will take quite some time to write software to these specifications."

An IBM spokesman disagreed. "We've given out more than 5,000 [Presentation Manager] development kits to software houses since last April," he said.

"Several companies said they will ship software using it in the fourth quarter. Presentation Manager is important now, and as each new application comes out, it will grow in importance," the spokesman added. ▢

OSI/NM gains new firms, scans data exchange plan

By Wayne Eckerson
Staff Writer

SHORT HILLS, N.J. — The OSI/Network Management (OSI/NM) Forum met last week to induct 21 new member companies and to review a draft specification for transporting data between network management systems from multiple vendors.

OSI/NM was formed this summer by eight major computer and communications companies to create a profile of network management specifications available within the Open Systems Interconnection model. The profile will serve as a blueprint for building interoperable network management systems.

The Forum inducted five voting members and 16 associate members at the two-day conference here. The new voting members are: Digital Communications Associates, Inc., GEC Plessey Telecommunications, Ltd., Nippon Telephone and Telegraph Corp., MCI Communications Corp. and Microtel, Ltd.

Members of the group also reviewed a 70-page proposal that

outlined how multivendor networks would exchange network management data over X.25 or 802.3 Ethernet networks using OSI protocols.

Voting members are expected to vote on the proposal in mid-December, according to Keith

“The requirements for a voting member are heavy, but we need that support,” Willetts said.

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Willetts, vice-president of the OSI/NM Forum.

According to Willetts, the Forum is currently drafting specifications based on OSI protocols that define how other types of management information, such as alarms and alerts, would be exchanged by network management systems. He said these

specifications would be ready for review by the first quarter of 1989.

Voting members are required to pay a \$50,000 initiation fee and a \$40,000 annual fee. They also are required to provide personnel to the Forum each year — two employees with technical expertise and one with management experience.

"The requirements for becoming a voting member are heavy, but we need that level of support if the Forum is to achieve its stated aim," Willetts said.

Willetts said the Forum's work could speed by two years the delivery of interoperable network management systems based on OSI protocols.

Other Forum voting members are AT&T; Hewlett-Packard Co.; Northern Telecom, Inc.; Unisys Networks, a division of Unisys Corp.; Amdahl Corp.; British Telecommunications plc; STC PLC, a London-based supplier of communications products; and Telecom Canada, a consortium of Canada's major communications carriers.

New associate members inducted last week include Cable and Wireless PLC, Interlan, Inc., Network Equipment Technologies, Inc. and Prime Computer, Inc. ▢

“If you’re running critical analog private-line applications, you’d be crazy not to have an APL modem that’s second to none.”

—Patricia Thomas, AT&T National Account Manager

"AT&T's analog private-line modems have a mean time to failure rate of up to 12 years. Second to none.

They have self-diagnostic systems, so they can report problems as they occur, and the problems can be resolved.

If there's trouble on the line, our modems can report it automatically to an AT&T Data Maintenance and Operation Control Center (DataMOCC), so that disrupted service can be restored before it affects your business.

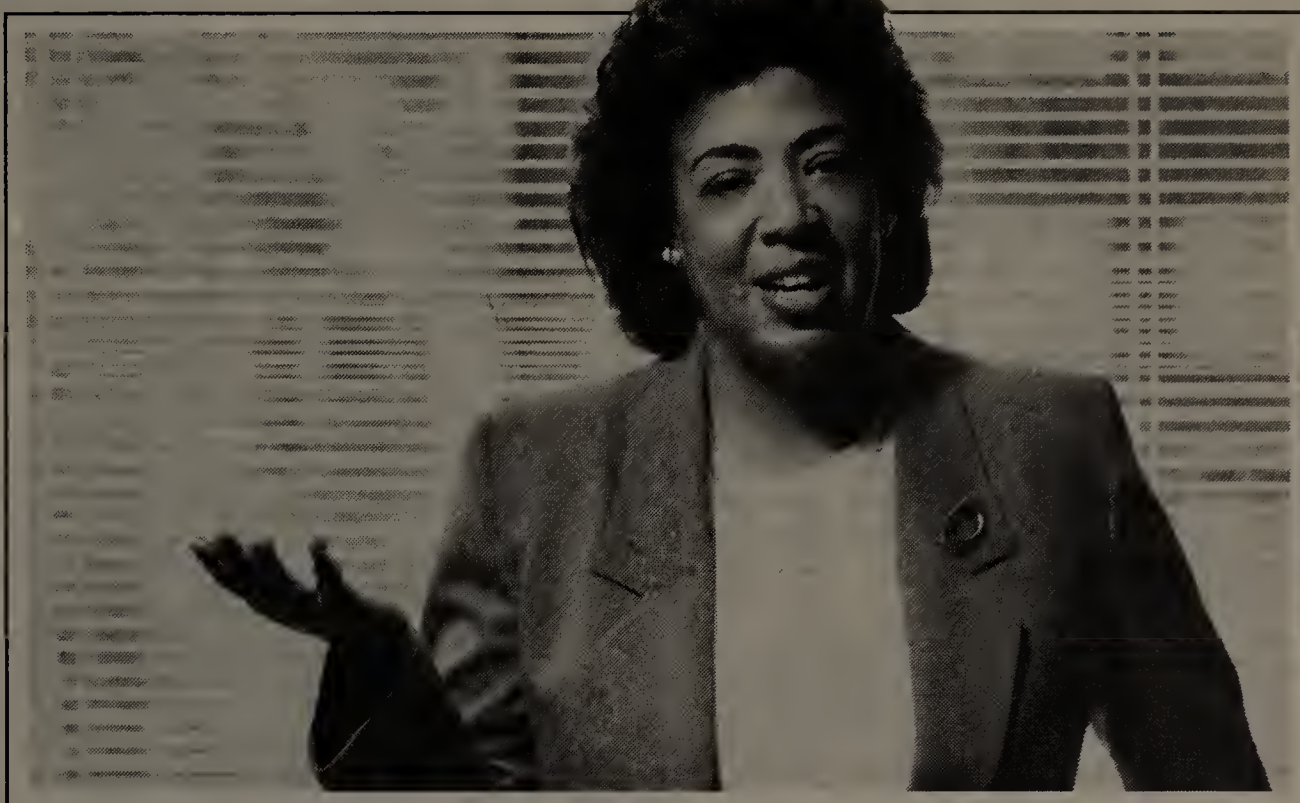
You can get automatic dial backup capability, so if there are problems on your private line, you're automatically connected to the switched network. This means you can eliminate the need for a second, backup private line.

These are AT&T analog private-line modems, designed specifically to work with the AT&T Network and as reliable as the network itself.

For virtually flawless, reliable data transmission, there's no better combination.

If your data transmission is critical to the profitability of your company, you can't afford anything else."

For more information about AT&T analog private-line modems, see your AT&T Account Executive, your authorized AT&T reseller or call 1 800 247-1212, ext. 718. In Canada, call 1 800 387-6100.



The right choice.

Fibronics unveils trio of FDDI networking products

Bridge, net mgmt. system and FDDI extender based on Advanced Micro Devices chipset.

By Laura DiDio
Senior Editor

BOSTON — Fibronics International, Inc. last week introduced the industry's first Fiber Distributed Data Interface (FDDI) networking products based on the Advanced Micro Devices, Inc. (AMD) SuperNet chipset.

The new FDDI products, the highlight of the LocalNet '88 Conference here (see "Halley Systems announces Ethernet Brouter upgrades," page 17), fit into the company's existing System Finex 8000 series.

The products include the FX8210, an Ethernet-to-FDDI Learning Bridge; the FX8510 System Finex Network Management System; and the FX8400, a multimode-to-single-mode fiber FDDI extender.

Use of the SuperNet chipset in place of discrete components lowered the cost of the products by about 40%, said Gregory Koss, a Fibronics senior product manager. "Our original product, the System Finex 8000, which has been shipping since April 1987, has a list price of \$40,000. The SuperNet chipset has made it possible to reduce the FX8210 to a single board and price it at \$24,900," Koss said.

Fibronics is hoping the lower cost will speed acceptance and installation of FDDI networks. The initial implementation of the products will be in backbone networks. The FX8210, an Ethernet-to-FDDI Learning Bridge, was specifically designed for that application.

The FX8210 supports protocol-independent bridging between Ethernet IEEE 802.3 local networks and FDDI backbones. No software changes are required.

"It's a plug-and-play product," Koss said. "The FX8210 lets users partition their existing Ethernets and connect smaller segments to the FDDI backbone, eliminating network congestion."

The bridge features self-testing and diagnostics and supports

the new FX8510 System Finex Network Management System, which can be used to control and monitor FDDI backbones.

The FX8510 is menu-driven and enables a single station or node to monitor and manage an FDDI backbone. It runs on an IBM Personal Computer or compatible and interfaces directly to any FDDI node on the network.

Based on the International Standards Organization's Open Systems Interconnection model, the FX8510 includes a complete historical data base of all network activities.

This assists network managers in network capacity planning and future network expansion. In addition, configuration management functions let users remotely control every System Finex bridge from a central location.

This, in turn, reduces the number of employees needed to maintain and service the network, Koss said.

The FX8400 FDDI Extender extends the maximum allowable distance between two adjacent FDDI networks to up to 25 miles using single-mode fiber-optic media.

It is targeted at users that want to use FDDI in an extended campus environment. The self-contained unit interfaces with the conventional dual-ring, 100M bit/sec FDDI multimode fiber and converts it to one single-mode fiber.

"Instead of having two rings bridged together, the FX8400 allows the user to make one large fault-tolerant network," explained Hal Spurney, Fibronics' director of marketing. "The use

of single-mode fiber allows users to increase the span of the network to cover a larger geographic area."

The IEEE 802.5 and ANSI FDDI standards presently specify use of only multimode fiber cable, which allows a maximum distance of 1.2 miles, or 2 km, between nodes.

Fibronics has marketed and installed the FX8400 in Europe during the last several months. It is an integral part of the first phase of an FDDI network linking toll booths on Italy's Autostrade ("Italy builds new Appian Way: sprawling FDDI net," NW, July 25).

The FX8210, the FX8510 and the FX8400 are shipping now. Delivery of the products occurs 60 days after receipt of order.

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New trading network in place

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"Especially in this post-crash environment, [brokerage firms] are looking to make sure they have options to go elsewhere should any one of the exchanges have systems problems or periods of huge volume in which their trades get backed up and delayed," said James Crofwell, the Boston exchange's executive vice-president and treasurer. "We're just another option, another opportunity."

The heart of the system

At the heart of Beacon are three Stratus Computer, Inc. XA 2000 Continuous Processing System minicomputers linked via StrataLINK, a high-speed processor-to-processor link. The network was pilot-tested last spring and currently serves three Boston Stock Exchange member brokerages: Dean Witter Reynolds, Inc., Fidelity Investments and PaineWebber, Inc.

Although available only for a few months and used only by these three companies, Beacon already handles 25% of the approximately 3,500 total trades executed each day at the exchange, according to Crofwell. The remaining trades are paper-based.

If successful in luring more trades to its floor, Beacon will increase the exchange's transaction fee revenue. "About 70% of our revenue comes from transaction-related fees and charges," Crofwell said.

The Boston exchange also charges members annual dues and provides services such as accounting, financing and news wire services for a fee.

Fast trades

But Beacon also makes it possible to route trade orders to stock specialists on the trading floor faster than manual paper-based methods. Specialists are the only people able to actually buy and sell stocks.

The specialists, also called market makers, work for broker-

age firms who are members of the exchange. Specialists are responsible for trading only a few specific stocks. Brokers looking to buy or sell stocks for their customers must contact the specialist who trades that stock.

Specialists try to buy stock from brokers at one price and sell

least four drops.

Larger trades are routed to a broker trading station on the floor. The floor brokers and specialists use Zenith Data Systems microcomputers to view stock quotes and transactions and a Kimtron Corp. terminal to enter and execute trades.

Floor brokers receiving the large orders can route them to the specialist offering the best



The floor of the Boston Stock Exchange

PHOTOGRAPHY ©1988 RICHARD CHASE

it to other brokers at a higher price, pocketing the difference.

With Beacon, brokerage firm members of the Boston Stock Exchange can link their own internal stock trade order-entry systems, which are typically IBM mainframes, directly to the Stratus minicomputers on the trading floor via 4.8K bit/sec or 9.6K bit/sec leased lines supporting IBM's Binary Synchronous Communications protocol.

Beacon will also support other communications protocols.

The Stratus system has been configured to convert incoming data to a Stratus-compatible data stream. In the future, the Boston exchange will enable smaller member brokerage firms with IBM Personal Computers to access Beacon via dial-up or leased lines.

Trades for up to 1,200 shares are downloaded to Beacon and routed to a specialist trading station on the trading floor via one of 25 19.2K bit/sec multidrop lines, each of which supports at

price. For a commission, they also execute orders from brokerages that do not own a seat on the trading floor.

When acting on commission, floor brokers take buy or sell orders over the phone and either route them to a specialist via Beacon or execute a paper-based trade.

Buy and sell orders for less than 1,200 shares appear on specialists' displays with the price attached. Beacon bases its price on the price paid in the last transaction involving that stock. A specialist wishing to quote a different price has 15 seconds to halt the transaction before it is automatically executed. Larger orders require manual intervention.

Once executed, trade detail reports are sent from Beacon to the brokerage house that entered the trade. The trade detail is also sent via a 9.6K bit/sec BSC line to the Securities Industry Automation Corp. (SIAC) in New York, which compiles a composite of trades on all regional exchanges and

sells that information to other stock exchanges and news wire services.

Eventually, the Boston Stock Exchange will link to SIAC's Intermarket Trading System, which will enable floor brokers on one exchange to route trades to specialists at other exchanges. Today, those trades must be phoned in or executed via an internal system.

Lastly, Beacon uploads a batch file of trade activity at the end of each day to an IBM 4381 mainframe used as a clearing and settlement system. It moves funds from buyers' accounts to sellers' accounts.

Manual method

In traditional paper-based trades, brokerage firms phone in or route trade orders to a floor broker's terminal or printer. Floor brokers negotiate trade orders with specialists using an intercom. When executed, both parties fill out paper slips to report the trade.

Data from those slips is manually entered into separate reporting systems, one that goes to SIAC, one that goes to the brokerage house that placed the order and one that goes to the clearing and settlement system.

Because automated systems handle transactions better, Crofwell said some brokerages seek exchanges with automation capabilities. "Because of systems like Beacon and because of automation initiatives taken by the regional stock exchanges collectively, the regionals now execute 25% of all daily trades," he said.

While Beacon today can handle more trades than the manual processes, it is unclear what the system's upper limit will be. "Whether our people resources are enough at the trader end to handle as many trades as the system can handle will be a question we won't be able to answer until we approach 20,000 to 30,000 trades a day," Crofwell said.

"Today we do 3,000 or so trades on average and maybe 2½ to three million shares," he said. □

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Networks put RRs on track

continued from page 1

While both are intended to meet the same business goals, the test networks are based on different technologies.

Union Pacific, based here, has been testing its Advanced Train Control System (ATCS) for 18 months. With ATCS, devices embedded in railroad ties provide location data to train-based sys-

tems that then relay the data to a central control site.

The company is one of at least a dozen railroad companies involved in an effort to standardize a version of ATCS for use across interconnected railroads.

In northern Minnesota, Burlington Northern is currently testing its Advanced Railroad Electronic System (ARES), which uses Department of Defense Navstar Global Positioning System satellites to pinpoint the loca-



Crew member checks computer in Union Pacific locomotive.

tions and speeds of trains.

The tests come at a time when

railroads have to compete not only with each other but also with the trucking industry, said Jeff Young, Union Pacific's ATCS director.

The deregulation of both industries has made it a business necessity to offer reliable service at competitive prices. Railroads have been criticized as unreliable, giving trucking firms the ability to wrest business away by moving freight in a more timely manner, Young said.

"If customers want a shipment in 96 hours, they don't want it in 84 and they don't want it in 108," Young said. "These systems will give us the ability to meet our customers' demands."

The track-bed transponders used in Union Pacific's ATCS system are spaced at intervals up to several miles.

As locomotives pass over the transponders, a device on the bottom of the train, called an interrogator, broadcasts a 200-kHz signal. The transponder returns a signal that contains its serial number.

On-board workstation

An Intel Corp. 80286-based workstation in the train's cab translates the serial number to a location, updates the train's odometer and stores the data.

Computers at the dispatch center here (similar to the prototype center pictured on page 1) poll on-board workstations to determine train locations.

That data is broadcast over a 900-MHz radio band to radio stations spaced along the company's tracks. Data is transmitted from the base stations to the dispatch center using leased lines, fiber cable or microwave facilities.

Six Digital Equipment Corp. VAX 8530s at the dispatch center handle conflict resolution, calculating the points at which trains can pass each other. Only three VAXes are active at one time, one for each of Union Pacific's three regions, while the others are hot backups, Young said.

Trains are displayed and their locations constantly updated on a massive panoramic screen at the dispatch center.

Dispatchers at workstations in the center can transmit electronic messages to trains regarding changes or corrections they should make.

The messaging system will replace the current radio links used to issue verbal instructions. This verbal system is difficult to understand because the radio frequency is crowded, and it is cumbersome because the crew has to acknowledge and repeat each message, Young said.

Signal light replacement

ATCS, now being tested on a stretch of track between western Nebraska and the Powder River Basin of Wyoming, will also replace the present system of signal lights that is used to direct rail traffic.

The lights are inefficient, Young said, because they are spaced to accommodate the heaviest trains on the line, meaning lighter trains are forced to start braking well before it is actually necessary. That slows train traffic and effectively reduces the number of trains that can be fielded at any one time.

The more detailed location information ATCS provides will allow dispatchers to reduce the distances between trains by better controlling their speed.

(continued on page 48)

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

“We will keep proprietary standards as long as it is economically viable. But we’re telling you now that we’re going to OSI, and that’s where we want you to go too.”

James Tripplet
Networking support specialist for the Eastern area Sun Microsystems, Inc. Speaking to users at the recent Inforum-Georgia Institute of Technology symposium in Atlanta

People & Positions

James Adams recently was named president and chief executive officer of **Southwestern Bell Telephone Co.** in St. Louis.

Adams, formerly president of Southwestern Bell Telephone’s Texas division, succeeded **John Hayes Jr.**, who retired.

Elliott McEntee recently was named president and chief executive officer of the **National Automated Clearing House Association (NACHA)**. McEntee replaces **William Moroney**, NACHA’s first full-time president, who is leaving to start a publishing business.

NACHA is a national trade association representing 42 automated clearinghouse associations in the U.S., their more than 17,000 financial institution members and their more than 50,000 corporate customers.

Votrax International, Inc., a Troy, Mich.-based maker of voice-processing systems, recently appointed **Larry Jernigan** president and chief operating officer following the resignation of Executive Vice-President **John Reynolds**.

Jernigan, who joined Votrax International earlier this year as vice-president of sales, will assume responsibility for all company activities. ■

Big Blue shares its game plan for boosting VAN use

IBM makes it easier to use Information Network.

By **Bob Brown**
Senior Writer

NEW YORK — In a recent press briefing, IBM outlined its strategy for encouraging greater use of its commercial value-added network (VAN) by international corporations.

IBM hopes to get more users onto the IBM Information Network, which supports both IBM and non-IBM devices and offers electronic data interchange (EDI), electronic mail and access to information services.

Syd Heaton, general manager of the Tampa, Fla.-based Information Network, said IBM can save users money by helping them avoid major expenditures on equipment to support international networking.

In recent days, IBM has taken a number of steps designed to make it easier for companies to use the Information Network. First, the company consolidated its network operations in North America, the UK, Japan, Europe and Canada under an umbrella title — the IBM Information Network. The network had previously operated under a variety of names.

More importantly, Big Blue created a common, single-signature agreement designed to simplify contracting for the net-

work’s international users. In the past, users had to work out separate contracts for network services in each nation.

Heaton admitted that “it was a true test of faith” for IBM customers to put up with the former method of contracting for international service.

Furthering its international scope, IBM also announced that Hong Kong and Ireland will be served by the net. Now more than 70 countries will be served directly by the network. Countries in Latin America and the Pacific Basin are likely targets for future IBM Information Network connections, Heaton said.

The network can support sites in 50 other countries through X.25 packet-switched connections, he said.

IBM played a major role recently in helping the U.S. persuade Japan to drop a requirement that international VANs had to comply with certain standards. That gave another boost to the company’s international efforts, said Fernando Casas, director of Intercontinental Information Services for the IBM Information Network. This will allow IBM to offer its proprietary network services more easily in Japan, he said.

(continued on page 47)

INDUSTRY BRIEFS

Centel Corp. recently announced the sale of its interest in **Advanced Telecommunications Co.**, a fiber-optic long-haul carrier, to **Alltel Corp.** for \$46.3 million. The sale completes Chicago-based Centel’s decision to exit the long-haul business.

Centel also released financial results for the third quarter, which ended Sept. 30. Net income was \$37.3 million, down 5% from \$39.2 million a year ago. Third-quarter revenue was up 5%, to \$325.5 million from \$309.7 million in the comparable period last year.

Centel provides local telephone exchange service in nine states, operates cellular mobile communications systems, provides cable television service and markets, designs and installs telecommunications and data network systems.

Sun Microsystems, Inc. last week announced plans for its first offshore manufacturing facility, which will be located in Linlithgow, Scotland.

The new facility will be used to manufacture a range of Sun’s desktop systems and is expected to employ about 300 people by 1991. Construction is slated to begin in February 1989.

Teltone Corp., a Kirkland, Wash.-based manufacturer of telecommunications equipment, announced at its annual shareholders meeting last month that it is formally soliciting offers to buy the company.

Teltone has hired a firm specializing in corporate acquisitions and mergers with the hope that a buyer can be found to pay shareholders a fair price and keep Teltone operating, the company said. ■

Tigon miniprofile

Founded: 1983

Primary business: Voice-messaging services

Target market: Midsize to large businesses

Major customers: Eastman Kodak Co., Ford Motor Co., Intel Corp.

Acquired by
Ameritech: October 1988



CHART BY SUSAN J. CHAMPENY

SOURCE: TIGON CORP., DALLAS

Tigon set on success under RBHC’s wing

Voice-messaging service bureau’s acquisition by Ameritech will let it move into new markets.

By **Wayne Eckerson**
Staff Writer

DALLAS — This summer, John Beletic, president of Tigon Corp., approached Ameritech with hopes of entering into a joint venture in the voice-messaging business.

During the negotiations, officials of the regional Bell holding company proposed a different

ANALYSIS

kind of venture: Ameritech offered to buy Tigon, a leader in the fledgling voice-messaging service bureau industry.

The proposal took Beletic by surprise. “We weren’t looking to get acquired,” he said. “But they offered us a very attractive package. It was a nice multiple over what our investors paid.”

With Ameritech’s help, Beletic said, Tigon will be able to expand its offerings for large users and target the smaller business and residential markets.

Analysts agreed that the acquisition was a coup for Tigon, assuring it a healthy future.

“Ameritech will help Tigon enter the small business and residential markets in the future. Ameritech has the money and name recognition, especially in its regional market, that Tigon needs to continue to expand its services,” said Don Van Doren, chairman of Vanguard Telecommunications, Inc., an independent consulting company specializing in voice messaging.

Founded five years ago, Tigon operates a global voice mail network that supports voice-messaging services for more than 300 U.S. companies. The services include two-way voice messaging, network maintenance and administrative support.

Under the terms of the acquisition, which was for an undisclosed amount, Tigon will retain its name and operate as an independent unit within the Ameritech Enterprise Group, Ameri-

tech’s unregulated information services venture.

“We are not going to tamper with what is a successful company,” said an Ameritech spokesman. “Tigon will maintain its organizational integrity and operate as a stand-alone business.”

The acquisition gives additional momentum to Tigon, which has had a good deal of success in signing on large corporate customers. The company recently signed a contract worth an estimated \$10 million with Eastman Kodak Co. to operate its 22,000-user voice mail network. It re-

The proposal took Beletic by surprise. “We weren’t looking to get acquired,” he said.

▲▲▲

portedly was the largest single contract ever signed in the service bureau industry (“Kodak plans move from private voice mail net to service bureau,” *NW*, Oct. 24).

The Kodak deal was one of eight major contracts Tigon has signed or renewed with leading U.S. corporations within the last six months. Other companies include Ford Motor Co., Michigan Bell Telephone Co., Southern New England Telephone Co. and General Foods Corp..

For Ameritech, the purchase enables it to make a fast entry into the rapidly expanding voice mail industry, which was opened to the Bell operating companies in a ruling last March by U.S. District Court Judge Harold Greene.

“The buyout was friendly, and the two companies make a good fit. Tigon was looking for a part-

(continued on page 10)

Tigon set under RBHC's wing

continued from page 9

ner to help it expand its services, and we were looking to enter the voice mail marketplace," the Ameritech spokesman said.

Ameritech stands to benefit as much as Tigon, if not more, from the deal, Van Doren said. Tigon has an elaborate digital network that surpasses the offerings of many voice-messaging vendors

in functionality and flexibility.

While many BOCs have purchased voice-messaging equipment and tested voice-messaging services with certain customers, none are marketing the services or can match the size and scope of Tigon's operations.

Tigon's network services

Tigon's Trax network is an all-digital network that connects facilities in 12 major U.S. cities with multiple X.25 lines. More than 50

T-1 lines from carrier points of presence or teleport locations link 16 additional cities to the Tigon network.

Users outside the reach of the local access lines use 800 long-distance service to connect them to the nearest point of presence in the network.

The Trax network also is joined to six net centers in Japan and one in London by American Satellite Co. AmSat links.

This decentralized digital net-

work saves money for large geographically dispersed companies because it cuts down on long-distance phone calls and frees them from having to build and maintain their own networks, said a Tigon spokesman. Because the Trax net has hubs in most of the nation's heavily trafficked regions, users need only make a local call to send a message anywhere in the country.

Each Tigon network center houses a VMX, Inc. voice proces-

sor outfitted with a proprietary front-end switch. This Tigon switch triples the capacity of the VMX computer and makes it compatible with Centrex systems and many different private branch exchanges, the Tigon spokesman said. VMX is a voice-messaging equipment manufacturer based in Dallas.

Besides standard two-way voice messaging, the Tigon switch provides several features that customers usually cannot get unless they have their own voice-messaging system. These features include message waiting, which notifies a user if a voice message is pending; call answering, which automatically answers incoming phone calls with a pre-recorded message and takes messages; and remote monitoring, which allows a communications manager to monitor traffic and change mailbox addresses without Tigon's assistance.

In addition, Tigon offers maintenance and administrative support programs for companies that operate their own voice-messaging nets. These services have convinced several large firms to hand over the responsibility — and the headaches — for their private networks to Tigon.

"We are different from other service providers because we spend a lot of money on research and development. That has enabled us to develop proprietary technology, administrative support systems and the ability to coordinate a very large network at a low cost to the user," Beletic said.

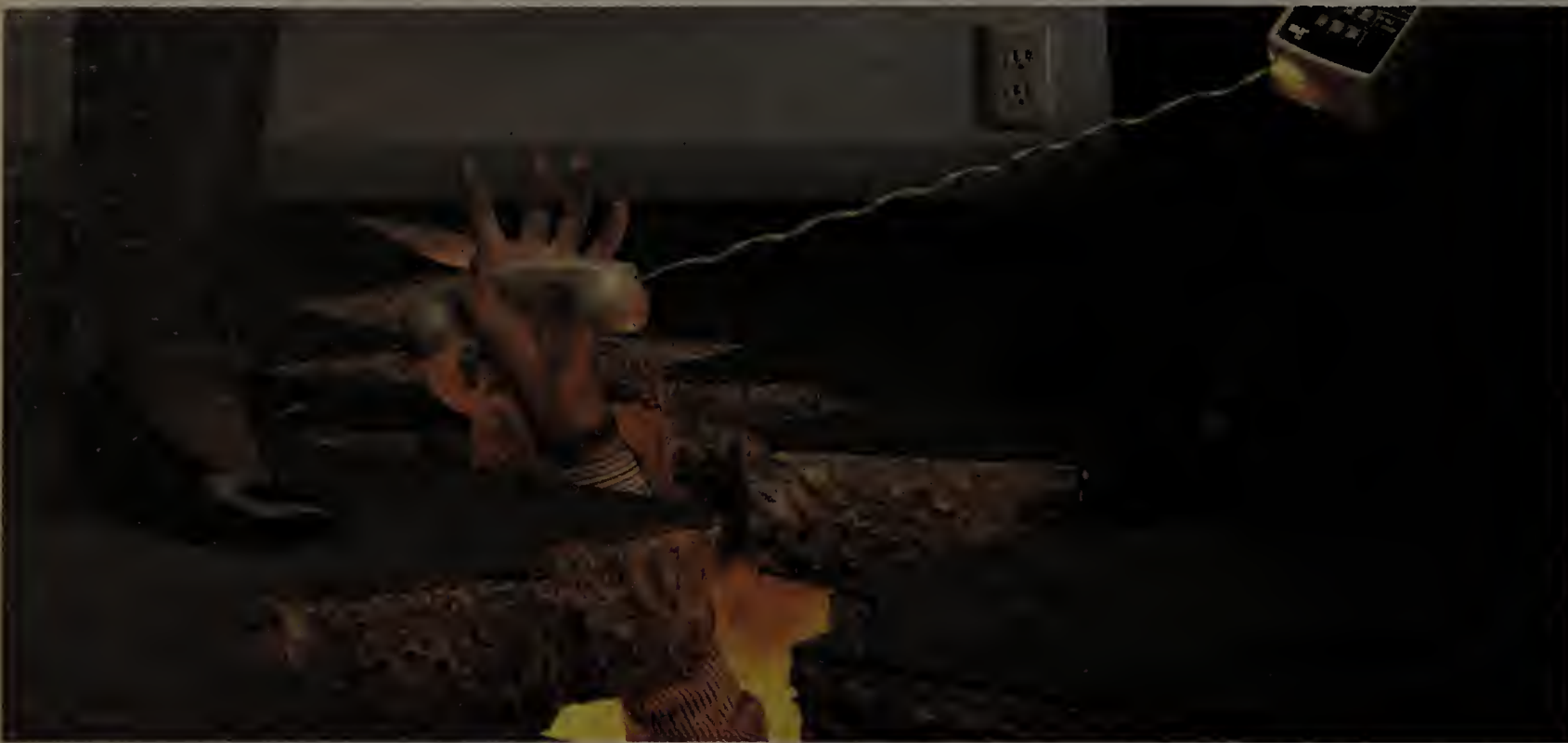
Tigon history

Tigon was founded in 1983 by Tom Bijou and Michael Fannin, both currently Tigon vice-presidents. Fannin came from VMX, where he developed the first commercial voice-messaging unit. Fannin and Bijou saw that customers were looking for a turn-key voice-messaging system that would allow them to avoid the costs and aggravation associated with piecing together a voice-messaging network.

When Beletic assumed leadership of Tigon in 1986, he moved the firm's headquarters to Dallas from Stamford, Conn., in order to consolidate corporate offices scattered throughout four states.

The result has been a surge of growth. Two years ago, Tigon concluded co-marketing agreements with subsidiaries of British long-distance provider Cable and Wireless PLC and Japan's international telephone carrier, Kokusai Denshin Denwa Ltd., to provide international voice mail service to Great Britain and Japan. Tigon has signed several multimillion-dollar contracts with major U.S. companies in the last year. These new contracts have quadrupled the number of voice mailboxes in Tigon's network and increased the company's revenues by 500% in the last three years.

Now that Ameritech has put its financial strength behind Tigon, it appears to have paved the way for Tigon's continued growth. □



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Worth Noting

New England Telephone and Telegraph Co. announced recently it has installed more than 74,000 miles of fiber-optic cable in its five-state region. The carrier said it plans to double that figure by 1993.

Carrier Watch

Williams Telecommunications Group, Inc. said last week it will build a fiber-optic link connecting San Francisco to Los Angeles. Construction of the \$28 million fiber route is scheduled to begin in January, with service to be available by the fourth quarter of next year.

The 433-mile fiber link will be tied into the carrier's coast-to-coast telecommunications network. Construction of the West Coast link will begin just as the company completes construction of a 544-mile fiber link connecting Cleveland and New York, according to the carrier.

Microtel, Inc. of Boca Raton, Fla., last week introduced a service that allows businesses in Florida and Georgia to make calls on their regular telephone lines while receiving the volume discounts of WATS service.

Designed for businesses spending between \$500 and \$8,000 a month on long-distance calls, the service, called Advanced LaserPLUS WATS, offers customers savings of up to 14% over traditional 1+ dialing service, according to Microtel.

The service is also 12% to 17% cheaper than comparable AT&T WATS rates, according to Microtel.

Microtel was recently acquired by Advanced Telecommunications Corp. (ATC), which serves eight other states in the southeastern and southwestern U.S. ATC provides long-distance service to all points in the U.S. and to more than 140 foreign countries. ■

NTI unveils new Centrex telephones

By Bob Wallace
Senior Editor

HOUSTON — Northern Telecom, Inc. introduced a new line of digital Centrex telephones, including an ISDN-ready unit, at the National Centrex Users Group meeting held here recently.

To promote use of the Centrex telephones, which take advantage of new central office switch software also unveiled by the company, Northern Telecom is allowing users to lease them from the company or from the Bell operating companies' equipment sales subsidiaries.

Under the terms of the program, monthly payments will be fixed for the life of the lease. In addition, equipment insurance will be provided in the lease financing. Users can also include the cost of delivery, maintenance and installation in the lease agreement, the company said.

The lease applies to the new Centrex Set M5009, the Centrex Speaker Set M5112, the Centrex Display Set M5209, the Centrex Power Set M5312 and the Centrex ISDN Set M5317T.

All five sets offer programmable line and feature buttons that

can be assigned directory numbers or Meridian digital Centrex features, including speed call, ring again or call forwarding, the vendor said.

Each of the new sets also features a built-in speaker and LCD indicators that correspond to each line and feature button to show idle, ringing and hold status, as well as feature activation, the firm said.

The M5000 Centrex telephone sets are also equipped with a release button, a hold button, a volume control button and a "hands-free" button that offers speakerphone-type features.

In addition to these features, the Centrex Display Set M5209 and the Centrex Power Set M5312 boast a two-line, 24-character alphanumeric display that shows call progress and calling information, including the name and the extension number of the calling party.

The most advanced of the five telephone sets, the Centrex ISDN Set M5317T, has a two-line, 40-character LCD that displays call progress and other calling information, and also lists the changing functions. If, for example, a caller receives a busy signal, five options — including cancel, ring again and redial — are displayed on the LCD. To use one of the options, the caller need only press the appropriate button.

The set's ISDN capabilities can be used only when both the call-

(continued on page 12)

Users to gain from AT&T's WATS shift

Analysts say carrier's plan to replace banded billing with mileage-based pricing will cut rates.

By Bob Wallace
Senior Editor

AT&T's plan to replace its banded WATS billing scheme with distance-sensitive pricing means savings and simplified network optimization for most AT&T WATS users, according to industry analysts.

The carrier proposed a \$697 million rate cut for its interstate switched services last month. The proposal included a 3.8% average rate cut and changes in access methods and billing for WATS.

If approved, the new rates and the change in WATS pricing will go into effect Dec. 1.

WATS users will save money by using regular access lines, rather than more expensive WATS access lines, to link to AT&T points of presence. Local access lines can be used to carry both WATS and non-WATS calls.

Users will also probably save some money under the new distance-sensitive pricing plan.

Under the current banded billing scheme, WATS rates are calculated according to geographic service bands. A user pays a certain amount for a call placed to a site in Band 2, for example, regardless of how far the call actually traveled. In addition, users had to buy WATS lines to serve each band. A Band 1 line for local sites cannot be used to deliver calls to locations beyond Band 1.

When the new rates take effect, WATS calls will be billed based on the distance they travel.

According to AT&T, the cost of WATS calls placed to sites 125 miles or more away will either remain the same or drop. The cost of WATS calls placed to sites less than 125 miles away will increase, according to the company. The carrier said one-fourth of all interstate calls carried over its network are placed to sites less than 125 miles away.

Savings from calls longer than 125 miles will more than offset increases for calls under that distance, said Jerry Harder, sales support manager and marketing analyst for Telco Research, a Nashville-based firm that sells network optimization software and services.

Harder said only a small number of AT&T WATS users will notice major changes in price between banded WATS and distance-based WATS. Only users that experience unpredictable increases in short-distance call volumes would be hurt by going with mileage-based WATS, he said.

Users that move from a banded WATS service to a distance-sensitive offering will find optimizing networks for cost a far less complicated process, Harder said. "With [mileage-based WATS service], the user doesn't have to optimize and reoptimize his network each time the company's calling patterns change," he said.

"At present, users have to take a hard look at the volume of traffic in each band to determine if they are making the best use of WATS service," Harder said. With mileage-based WATS, the user has to ensure only that there are enough local access lines to handle traffic volume, he explained.

The elimination of banded WATS services may also cut demand for some types of network optimization software, according to Michael Hills, president of HTL Telemanagement Ltd., a Burtonsville, Md.-based consulting and software sales group.

WATS users will save money by using regular access lines to link to AT&T POPs.

▲▲▲

"[The user] will not need sophisticated software that determines how many Band 1, 2, 3, 4 and 5 lines he needs to handle WATS calls," Hills predicted. Instead, users will turn their attention to comparing the cost of WATS services offered by other common carriers.

In addition to easing network optimization, the restructured WATS calling plan and other service changes will help AT&T prevent WATS customers from migrating to services offered by its rivals, analysts predicted. Both MCI Communications Corp. and US Sprint Communications Co. offer banded WATS services.

Michael Dillingham, a consultant with Comsol Ltd., a Houston-based consulting firm, said AT&T had to spruce up AT&T WATS or lose customers.

"The reason AT&T is making [these moves] is because the other carriers are pricing their WATS services more aggressively every day," Dillingham explained. "AT&T had to respond to the

(continued on page 12)

WASHINGTON UPDATE

BY ANITA TAFF

Tariff 12 net given go-ahead. The Federal Communications Commission recently allowed AT&T to proceed with its fifth custom network offered under Tariff 12 while the FCC investigates the legality of the tariff.

The investigation of this latest network, designed for American Express Co., will be included in the FCC's investigation of three previous Tariff 12 plans for General Electric Co., E.I. DuPont de Nemours & Co., Inc. and Ford Motor Co.

Despite objections raised by MCI Communications Corp., US Sprint Communications Co., the Puerto Rico Telephone Co. and the International Data Communications Manufacturers Association, the FCC ruled that none of the arguments show the tariff to be "so patently unlawful as to warrant rejection." Critics argue that the only custom aspect of Tariff 12 offerings is the preferential rates given to large customers by AT&T.

The FCC will indicate the specific areas to be investigated in a future order. In addition to the investigation, the FCC also ordered AT&T to keep separate accounting records on revenue, costs and investments in Tariff 12 networks so it can determine whether AT&T is raising the prices of other services to compensate for possible losses from Tariff 12 offerings.

Leaving the U.S. in the dust. The U.S. telecommunications industry, paralyzed by battles among users, carriers, information services providers and regulators, is falling behind other countries, according to William Ferguson, vice-chairman of Nynex Corp.

Speaking at the Information Industry Association meeting in Washington, D.C. last week, Ferguson said, "We waste too much

(continued on page 12)

Users to gain from AT&T's WATS shift

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marketplace," he added.

Several analysts said AT&T is simply dressing up AT&T WATS until it can persuade subscribers to migrate to one of its Pro WATS services. The carrier renamed its Pro America I, II and III bulk-calling services AT&T Pro WATS I, II and III. The analysts contend that the carrier wants to move AT&T WATS users to Pro WATS II and Pro WATS III because Pro WATS services are more lucrative for AT&T.

Robert Ellis, chairman of The Aries Group, Inc., a Rockville, Md.-based consulting firm specializing in voice/data network design and tariff analysis, said AT&T has tried to ease this migration by waiving onetime installation and service order fees

for AT&T WATS users that want to convert to Pro WATS.

Ellis said AT&T WATS users have long sought price cuts and WATS discounts.

AT&T filed for two new volume discounts for WATS. Users that spend \$200 to \$2,000 a month on the service will receive a 10% day-rate discount. Users that spend more than \$2,000 a month will receive a 15% discount on day rates. The carrier is already offering call-detail reports — in tape form — for a onetime \$54 charge ("AT&T shave rates, resets WATS prices," *NW*, Oct. 24).

Ellis predicted that MCI will quietly drop its banded WATS service — MCI WATS — and US Sprint will scrap its banded WATS offering — US Sprint Banded WATS. Both AT&T rivals said they have no plans to terminate their banded WATS services. **■**

NTI unveils new Centrex telephones

continued from page 11

ing party and the called party are served by an ISDN-compatible Northern Telecom central office switch, the vendor explained.

In that scenario, the name and telephone number of the calling party would be passed to the called party's telephone set and displayed on the set's LCD.

Where ISDN is not available, the set will receive and display only the caller's name and telephone number if both parties are part of the same Centrex.

The set can be equipped with an optional RS-232 data port that lets any asynchronous desktop data terminal equipment access circuit-switched data, Northern Telecom said.

The switch maker's latest central office switch software program, the Centrex Power Package I, supports a number of ISDN calling features. A central office switch running the software will support the following features:

■ **Calling name display.** The central office switch will pass the name and number of the calling party to the called party. The data is displayed on the Centrex telephone set's LCD before the call arrives.

■ **Call forwarding information.** This shows callers that their calls are being forwarded. The telephone set's display posts the number to which the call is forwarded and the name of the user at that telephone.

At the other end, the person answering the call is shown the name and number of the calling party, the called party and the reason the call was forwarded, the vendor explained.

■ **Call origination display.** This enables the caller to verify the name and number being called right after dialing, thus helping the user catch dialing errors immediately.

The M5000 Centrex sets and Centrex Power Package I are available immediately, but the Centrex ISDN Set M5317T will not be generally available until the second quarter of next year.

Northern Telecom declined to give pricing for the new hardware or the central office switch software.

Northern Telecom can be reached by writing to 4001 E. Chapel Hill-Nelson, Raleigh, N.C. 27709, or call (919) 992-5000. **■**



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Our current openings require individuals with appropriate background in one of the following disciplines.

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Projects involve design and development of data communication protocols in an integrated voice and data environment.

Requirements: 3-7 years' experience in software development using structured software analysis and design methodology; communication architectures and protocols. Real-time programming in UNIX® and "C" preferred. Ada and workstations experience a plus.

COMPUTER ENGINEERING

Positions will interest candidates through the engineering management level, and focus on the development of state-of-the-art products/systems using 68000, 68020, workstations, etc.

Requirements: Experience in any of the following: real-time software design; microprocessor hardware (680X0); C/UNIX®; microprocessor applications and interfaces; common channel signaling No. 7; X.25 protocols; CAE and PCM; digital testing; digital and analog circuit design; firmware development; digital communications and DSP. Telephony experience preferred.

We are seeking risk takers who want to shape history, rather than merely to be swept up as a part of it. If you have the technical savvy, the entrepreneurial bent, and the enthusiasm for excellence, we can provide you with the environment and the tools so that you, too, can make your mark on the future.

Our compensation package recognizes and rewards level of experience, and is supplemented by a most generous benefit program. Indicating position of interest, submit resume with salary details to: Staffing Manager, Dept. #SS8273, Motorola Inc., Cellular Group, 1501 West Shure Drive, Arlington Heights, IL 60004. An equal opportunity/affirmative action employer.

For your convenience, fax your resume over our automatic "24-HOUR FAX HOT LINE" by dialing 1-312-632-5717



MOTOROLA INC.

Cellular Group

Advanced Electronics for a More Productive World.

Washington Update

continued from page 11

of our time and too many resources fighting each other, and too much time and money contending with conflicting legal and policy requirements." The "shameful result" is that other countries are racing ahead with new technologies and services while the U.S. argues over how or whether such services will be provided, he said.

Ferguson said such regulatory "wheel spinning" has thus far prevented Nynex from receiving permission to purchase a 50% interest in PTAT, a fiber-optic transatlantic cable.

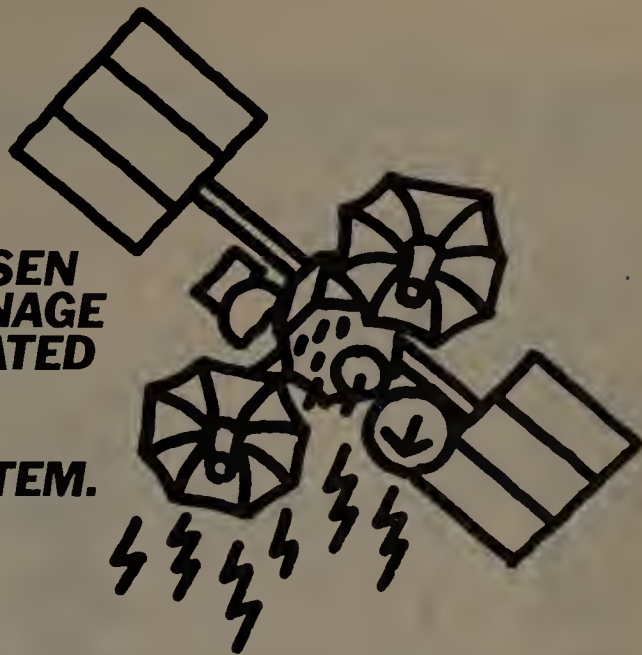
Voice mail group reports. Representatives of the newly formed Voice Mail Association of Europe also attended the Information Industry Association meeting to discuss the group's efforts to introduce enhanced voice services on a pan-European basis.

The group has nine members, representing telecommunications agencies in six countries: the UK, Italy, Switzerland, Sweden, West Germany and Spain. At a meeting scheduled for the end of this month, the association's members will bring together participants from European post, telegraph and telephone administrations and private providers of audiotex and voice-messaging services.

Global packet switching. Data America Corp., a Vienna, Va.-based carrier that is funded by Northern Telecom, Inc., is expected to announce today that its customers will be able to access packet-switching services in 62 locations worldwide through the facilities of Infonet Computer Sciences Corp., based in El Segundo, Calif.

Data America has already signed agreements with all seven regional Bell holding companies to provide inter-LATA packet-switching services in the U.S. **■**

**NASA HAS CHOSEN
CONTEL TO MANAGE
ITS SOPHISTICATED
TRACKING AND
DATA RELAY
SATELLITE SYSTEM.**



**WHAT ON EARTH
CAN WE DO FOR YOU?**

Six hours and 13 minutes after lift-off of the shuttle *Discovery*, NASA's newest communications satellite was rocketing toward an orbit 22,300 miles above the earth. Very soon it will start relaying messages between low earth-orbiting space vehicles and an earth station complex in White Sands, New Mexico; relaying voice, video, and digital signals thousands of miles with remarkable clarity and precision.

Contel is making this possible. We're managing NASA's incredibly sophisticated satellite communications system from the ground up. To those who know us, including the 2,500,000 customers in 30 states who call us "the telephone company," this isn't surprising. Few companies have our expertise and experience in creating advanced telecommunications systems for business and government.

Because we can satisfy needs as complex as NASA's, we believe we can satisfy yours. To learn more about Contel's capabilities in telecommunications, write to Contel Corporate Communications, PO Box 105194, Atlanta, Georgia 30348.

CONTEL®

BERLIN

DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

The biggest exhibit at last week's Unix Expo in New York was the IBM display boosting AIX, its Unix-based operating system. The 10,000-sq.-ft. booth held a net of computer systems, from ASCII display terminals to IBM's biggest mainframe, all supported by AIX. Computers were linked via a TCP/IP net supporting AIX as well as MVS, VM and DOS.

Data Packets

Data Race, Inc. introduced two new 2,400 bit/sec modems that conform to the CCITT V.22bis standard. Both Action 24 models employ error correction and data compression to at least double throughput, according to the company.

The more advanced of the new modems, the Action 24+, offers both Microcom, Inc.'s Microcom Network Protocol (MNP) Level 7 error correction and data compression and the new CommPressor algorithm, licensed from Adaptive Computer Technology. CommPressor can move common file types at three to four times the speed of normal V.22bis modems, the company said.

The algorithm determines the optimum compression scheme depending on the type of file. The modem can use 4:1 compression for large data base files or 2:1 compression for bit-image graphics files, for example. The 24+ model will be available in December at a price of \$795.

The low-end model, Action 24, features MNP Level 5, which can double the modem's throughput. This model, also available next month, costs \$595.

Data Race is located at 12758 Cimarron Path, San Antonio, Texas 78249, or call (512) 692-3909. ■

Globenet goes all out to be cheap VAN alternative

Firm sells stock to finance new marketing push.

By Paul Desmond
Staff Writer

ALEXANDRIA, Va. — Public value-added network (VAN) operator Globenet, Inc. recently sold 80% of its stock to finance an aggressive marketing effort aimed at promoting itself as a low-cost alternative to VAN giants Telenet Communications Corp. and McDonnell Douglas Network Systems Co.

Globenet's less expensive service results from its strategy to form a nationwide packet net by interconnecting Bell operating company packet nets instead of having to deploy equipment in all reaches of the continent.

The company said it can serve 80% of the population with its 15-node network, which is held together by a series of 56K bit/sec leased lines. Telenet and McDonnell Douglas' Tymnet, by comparison, maintain hundreds of nodes in their backbone nets.

Analysts said the BOC-inter-

connect strategy should enable Globenet to carve out a niche in the competitive VAN market, mainly by taking advantage of expected increases in the market's size.

Globenet's nodes are fourth-generation packet switches provided by Telematics International, Inc., one of the five companies that bought 80% of Globenet last month (see "Telematics acquires mux maker to widen net line," page 16).

A Globenet official said its target audience will initially be information providers such as Dow Jones Information Service Group and Source Telecomputing Corp. Next, the company will go after other industries familiar with packet switching, such as insurance and banking.

Finally, Globenet will direct its attention to companies that have not yet considered packet switching as a way to meet data commu-

(continued on page 16)

Telenet OKs firms' X.400 wares for its packet net

By Bob Brown
Senior Writer

BOSTON — Telenet Communications Corp. recently certified local network X.400-based electronic mail products from Retix and Consumers Software, Inc. for use with its packet-switched network services.

Telenet, the Reston, Va.-based data communications arm of US Sprint Communications Co., announced the certifications at the Electronic Messaging '88 conference here.

The trick is for the companies to convince E-mail system vendors to adopt X.400.

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The X.400 standard enables dissimilar E-mail systems to exchange messages. The trick now is for Telenet, Retix and Consumers Software to convince leading vendors of local network E-mail systems to adopt X.400, according to Richard Kozak, Telenet's vice-president and general manager of electronic messaging.

"We believe that these two vendors are the tremor that will precede a landslide endorsement of the X.400 standard in the LAN E-mail community," Kozak said.

X.400 local network gateways will enable users of one local network messaging system to use X.400-compatible network services to communicate with any other vendor's local network messaging system, he said.

Telenet's certification of Consumers Software's and Retix's products means users of these products can communicate via Telenet with private E-mail systems that support X.400 and with subscribers to Telenet's Telemail 400, a commercial application of X.400.

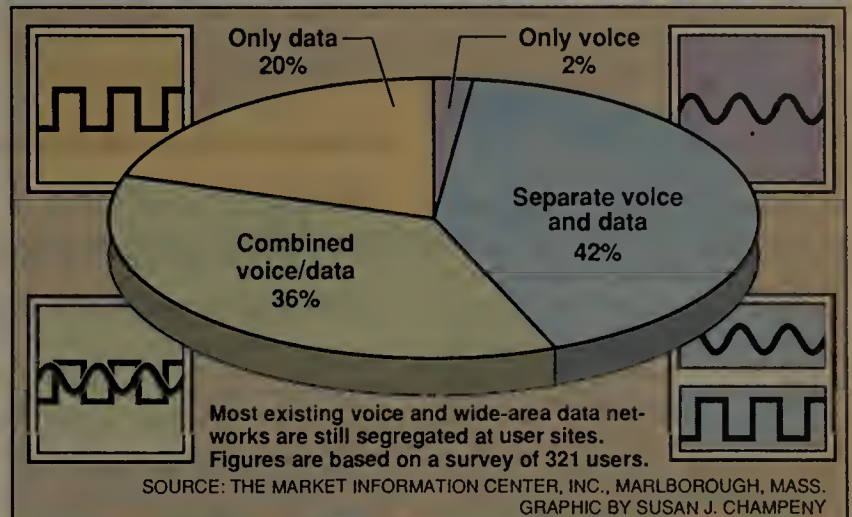
Consumers Software, based in Vancouver, makes The Network Courier group of local network messaging products — including The Network Courier 400, which was introduced at the show.

Retix, based in Santa Monica, Calif., provides the OpenServer 400 Series, products that can be used by E-mail and other local network personal computer software packages to access Telemail 400.

The first application supporting OpenServer to take advantage of Retix's certification is Retix-Mail, a turnkey X.400 E-mail

(continued on page 16)

Voice and data network types



Meteorologists need nets to track storms

National Weather Service uses many devices to pull together data and predict major hurricanes.

By John Cox
Senior Editor

MIAMI — In September, as Hurricane Gilbert was gathering strength in the Caribbean, forecasters at the National Hurricane Center (NHC) here were sifting through reams of data looking for clues that would show where the storm was headed.

The center receives its data from six sources, according to Mark Zimmer, chief of the NHC's tropical analysis center and the person in charge of the NHC's computers and communications.

Much of the data comes from the Suitland, Md., computer complex of the NHC's parent, the National Weather Service (NWS).

One source is an internal store-and-forward network called AFOS, which stands for Automation of Field Operations and Services. AFOS provides weather observation data and computer forecast models that are sent here from NWS mainframes. Hard copies of charts arrive via facsimile, a second source.

Other sources of information are two separate networks that provide the NHC with satellite pictures, a connection that carries sensor data from airplanes flying over the storms, and radio links that let meteorologists gather eyewitness information from trained observers aboard planes and in other locations.

On the basis of this mass of data, the meteorologists draw conclusions about what storms are doing and where they are heading.

The forecasts and storm warnings are typed into the AFOS network, which circulates the information to all other NWS offices and, via a gateway, to external users such as the military, overseas

weather services, civil defense, the media and other subscribers, Zimmer said.

The AFOS network, which is based on Data General Corp. minicomputers, was designed to eliminate paper from the forecasting process, said Zimmer.

In the past, observation data from NWS field offices arrived at the NHC via banks of Teletype machines that churned out reams of paper. This data was used to create NHC forecasts, which were then typed out by hand and reentered by Teletype operators for

Radio links let meteorologists gather eyewitness information from trained observers.

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transmission back to the field offices and to the central computers.

With the AFOS net, instead of sifting through paper, forecasters can now easily find the data needed with a few keystrokes, Zimmer explained.

Forecasters can call up weather observation data from the U.S. offices and use AFOS to retrieve weather maps, generated by the NWS mainframes, showing wind flow patterns.

These maps, the result of complex mathematical equations, reveal the present state of the atmosphere and predict how it will look 12 hours later, 24 hours later or, at most, 72 hours later.

The AFOS net also provides

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Globenet out to be alternative

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nications needs.

"We spent the last 18 months setting up the network, and now we're going to go out there and aggressively sell it," said Jose Prats, vice-president of marketing for Globenet. "The new funding is to expand our sales and marketing efforts."

Globenet faces formidable competition. At the end of last year, Telenet and Tymnet controlled a combined 75% of the estimated \$390 million VAN market with their extensive private networks of more than 700 nodes each, analysts said.

"Telenet and Tymnet own the market," Prats admitted. "But there's room for a third major player, and that player is collectively the Bell telephone companies. And they need an interexchange carrier like Globenet to make it work."

Globenet is not the only VAN provider to link the BOCs' networks. Data America Corp., a start-up formed with the backing of Northern Telecom, Inc., operates both a packet network that links the BOCs and a public T-1 network ("NTI-backed start-up plans to build advanced VAN," *NW*, June 20).

Telenet and Tymnet have agreements with some of the BOCs whereby subscribers on selected BOC networks can access Telenet or Tymnet using the BOC as a gateway as opposed to buying a separate direct link. Both companies are trying to expand that effort to include more BOCs, they said.

Globenet, though, uses the BOC networks as gateways to other BOCs, with Globenet being the interexchange carrier. Currently, it can offer access to BOC and independent carrier networks that together reach 77 local access and transport areas nationwide.

The company supports the BOC networks by running two or more 56K bit/sec dedicated lines from its nodes to the BOC network it wants to support. Each local BOC network is linked to at least two different Globenet nodes to provide redundancy.

For now, Globenet services the 20% of the country it cannot reach by reselling Telenet and Tymnet services at cost. Within the next 18 months, Prats said, Globenet should be able to reach the entire country.

Analysts said recent decisions by U.S. District Court Judge Harold Greene granting the BOCs the freedom to offer enhanced data communications services within their service areas created opportunities for companies like Globenet.

Jeremy Frank, program director for Gartner Group, Inc., a research company in Stamford, Conn., said Greene's decision will enable the BOCs to offer low-cost packet-switching services.

In a recent issue of a biweekly Gartner Group bulletin called

"Enterprise Network Strategies," Frank said Greene's decision could result in a doubling of the VAN market's annual growth rate by 1992, bringing VAN market revenue to \$3 billion by 1993.

A 9.6K bit/sec direct link from the customer's premises to the nearest Globenet local access point costs \$1,000 per month less than Telenet or Tymnet, according to a Globenet comparison of fixed monthly charges (which include miscellaneous fees, such as X.25 interface, mo-

‘We spent the last 18 months setting up the net, and now we're going to sell it,’ Prats said.

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He said small to midsize businesses will account for the lion's share of that increase by purchasing lower cost services from companies like the BOCs that were previously unaffordable.

For its part, Globenet is pricing its service much less expensively than rivals Telenet and Tymnet.

dem and account charges).

Globenet said its service costs \$475 per month, as opposed to \$1,665 and \$1,615 for Telenet and Tymnet, respectively. Telenet and Tymnet confirmed the accuracy of those figures. In parts of New York and Nebraska, Globenet charges \$100 per month for its 9.6K bit/sec service.

Telematics acquires mux maker to widen net line

By Paul Desmond
Staff Writer

FORT LAUDERDALE, Fla. — Packet switch maker Telematics International, Inc. recently completed the third in a series of acquisitions that will allow the company to offer users a wider range of networking products.

Best known for its Net 25 Programmable Communications Processors, used mainly in packet-switching applications, Telematics is now trying to position itself as a T-1 vendor as well by breaking into the high-speed packet-switch market.

Toward that end, Telematics recently acquired T-1 multiplexer manufacturer Spectrum Digital Corp. of Herndon, Va., and purchased a 26% interest in Network Automation Holdings Pty. Ltd., a Sydney, Australia-based company that makes a line of packet switches capable of processing more than 20,000 packet/sec.

Network Automation also has contracts with government departments in Australia and New Zealand, relationships on which Telematics expects to capitalize.

The most recent Telematics investment, made with a group of four venture capitalist companies, was in Globenet, Inc., a public packet network carrier based in Alexandria, Va. Although it would not disclose the amount of that investment, Telematics and the four other companies together now own an 80% interest in Globenet, although none of the five own a controlling interest.

Globenet uses the Telema-

tics Net 25 products as the foundation for its backbone network that links local packet networks owned by the Bell operating companies.

Telematics expects its investment in Globenet to provide a natural market for Telematics products among the BOCs, said William Brindle, a Telematics founder and vice-president of market development and planning at the company.

Brindle said the Net 25 Programmable Communications Processor can be configured with application software to function as a packet network access node, a packet switch or a network management center.

Net 25 software is available to provide an X.25 interface to packet networks and to provide support for devices using such protocols as Synchronous Data Link Control, 3270 Display Systems Protocol and asynchronous protocols.

Kathryn Korostoff, a senior analyst at International Data Corp., a Framingham, Mass.-based research firm, said that, as of the end of 1987, Telematics was fourth in the \$332.5 million packet-switch market behind Telenet Communications Corp., BBN Communications Corp. and McDonnell Douglas Network Systems Co., which runs the Tymnet net.

Last week, the company reported third-quarter revenue of more than \$15.6 million, up 33% from last year's revenue for the comparable quarter, setting a company record for one quarter. Pretax earnings were up 32% from last year to more than \$3.8 million. ■

In addition, Globenet charges a flat usage rate of \$3 per hour, whether traffic originates in a high-density Class A city, such as Philadelphia, or a low-density Class C city, such as Altoona, Pa. Usage rates during Tymnet's peak traffic period of 6 a.m. to 7 p.m. weekdays ranges from \$4.45 per hour in a Class A city to \$11.45 per hour in a Class C city.

Telenet's pricing system is more complicated since the first two minutes of a Telenet call are billed at a higher rate than the rest of the call.

Thomas Jensen, Telenet's director of market support, said that, using an average call length of 10 minutes, its hourly usage rates range from \$4.43 in a Class A city to \$12.73 in a Class C city during peak calling periods.

Telenet and Tymnet both offer discounts for high-volume users, but even at the maximum discount rates, Globenet claims its service is less expensive by more than \$1 per hour.

That figure is accurate for Tymnet, a spokesman confirmed. Jensen could not confirm or deny the comparison for Telenet.

But will Globenet make a dent in the VAN market?

"I really think they will," Frank said. "It might take a couple of years. I don't know if they'll dent Telenet and Tymnet's market. My argument is that they'll be able to grow the market and get that share."

Warren Prince, chairman of McDonnell Douglas Network Systems, agreed with Frank's assessment. He said if the market grows as expected, Globenet may find a place for itself. But he expects Tymnet's reputation will continue to garner new customers. We are "concerned about any competitor, but I don't perceive [Globenet] today as being a major threat," Prince said.

A spokeswoman for Telenet argued that, while Globenet's service may be less expensive, Telenet's is of higher quality and offers more services.

She said the differences between Telenet and Globenet are analogous to the difference between self-service and full-service gas stations: Full-service stations cost more but offer more services.

Prats maintained otherwise. He said Globenet offers the same services as other carriers. The network supports end-to-end error protection, which is inherent in X.25 and is backed by the field maintenance units of the BOCs.

For troubleshooting, Prats said Globenet has hierarchical network control.

It controls the backbone and transfers troubleshooting to the 26 regional control centers operated by the BOCs when appropriate.

For security, Prats said Globenet offers a feature it calls Closed User Groups (CUG), which he said are virtual private networks. Any number on a CUG list can call another, but nobody outside the CUG can call into it. ■

Telenet OKs X.400 wares

continued from page 15

package that runs under Microsoft Corp.'s Microsoft Windows.

Rick Fant, project manager in charge of the integration of internal E-mail systems at US West, Inc. and a Consumers Software user, said the newly announced services are timely and needed.

"We're basically interested in any X.400 products," Fant said. "Vendors that stick with proprietary products are headed nowhere."

Expanding its connections with the private E-mail systems of major vendors in the market, Telenet also announced that it has certified Honeywell Bull, Inc.'s ONEmail Electronic Mail and the private E-mail system of Convergent Technologies, Inc. for Telemail 400 commercial service.

The certification allows these E-mail systems to communicate with other private E-mail systems supported by Telenet and with more than 300,000 users of Telenet's Telemail service.

Private E-mail systems from Wang Laboratories, Inc. and Hewlett-Packard Co., and E-mail connectivity software from Soft-Switch, Inc. are also being tested for X.400 interoperability, Telenet said.

‘Vendors that stick with proprietary products are headed nowhere,’ Fant said.

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Previously, Telenet certified E-mail systems from IBM, Data General Corp. and Digital Equipment Corp. for X.400 connectivity.

In other announcements, Telenet said it expanded its Telemail 400 service into the UK, Italy and Chile.

Telenet also said that agreements with Australia, Belgium and Sweden will be wrapped up by the end of the year and that agreements in principle for X.400 interconnection have been reached with Malaysia, Mexico and Norway. The company already provides service among the U.S., Canada, Japan and Taiwan.

Another new service introduced by Telenet was Telenet Fax, which allows customers to send facsimile messages from a terminal or personal computer to most facsimile machines in the world.

The service will be available to any private E-mail system or office automation system that connects to the Telenet Public Data Network in accordance with the X.400 standard. The service is provided using Telemail and US Sprint's fiber-optic network. ■

LOCAL NETWORKING

PC AND TERMINAL-TO-HOST LANS, GATEWAYS AND MICRO COMMUNICATIONS PRODUCTS

Worth Noting

"The LAN Manager, jointly developed by Microsoft Corp. and 3Com Corp., is a standard in and of itself. And while many vendors will market their own LAN Manager product, it won't appear on the market in dozens of incompatible versions."

Alan Kessler
Product line manager
3+Open products
3Com Corp.
Santa Clara, Calif.

Netnotes

Fibronics International, Inc. last week reported record revenue and earnings for its third fiscal quarter, which ended Sept. 30.

It was the company's second straight quarter of profitability after four consecutive quarterly losses, a company spokesman said. Sales for the third quarter were up 16% to \$10.5 million, compared to \$9.1 million during the comparable period a year ago.

Net income for the quarter reached a record \$723,000, compared to a \$353,000 loss in 1987's third quarter.

Revenue for the first nine months of the year was about \$29.8 million, up 12% from \$26.5 million for the first three quarters of 1987.

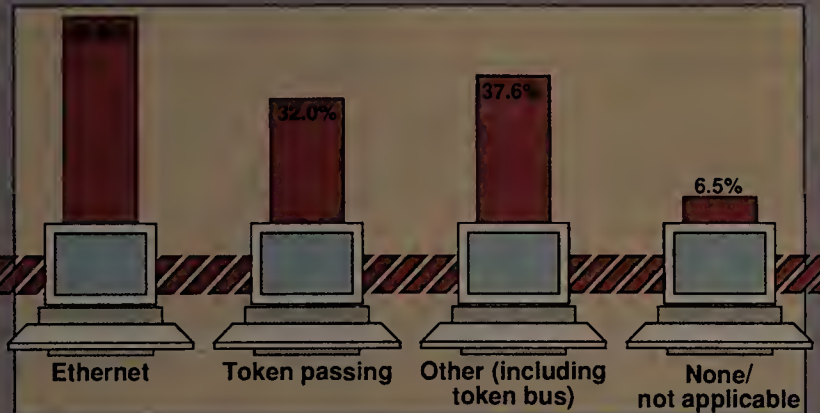
Earnings for the first three quarters of 1988 were \$197,000, compared with a loss of \$850,000 for the comparable period in 1987.

Alantec, Inc. last week introduced a fault-tolerant Ethernet local network at the LocalNet '88 Conference in Boston. Called the Fault-Tolerant Ethernet LAN (FTEL), the product is a dual-port Ethernet interface for IBM Personal Computer AT and compatible computers. The FTEL provides network redundancy in the event of a trans-

(continued on page 18)

Popularity of LANs

Which of the following LANs is currently used at your organization?



Figures are based on a survey of 377 users selected at random from *Network World's* subscriber list. Percentages total more than 100% because some sites employ more than one LAN technology.

SOURCE: INTERNATIONAL DATA GROUP, FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

Halley Systems announces Ethernet Brouter upgrades

By Laura DiDio
Senior Editor

BOSTON — Halley Systems introduced the latest members of its ConnectLAN remote Ethernet bridge/routers at last week's LocalNet '88 Conference here.

The latest ConnectLAN 100 Brouters combine routing functions with the performance and protocol independence of network bridges, according to the company.

"It gives users a cost-effective method of internetworking their various LANs under the remote control of a network management system," said Jack Hughes, a Halley product line manager.

ConnectLAN 100 Brouters connect geographically dispersed local networks over a variety of wide-area serial telecommunications links to form an integrated network.

As a result, Hughes said, users on separate networks can communicate, exchange data and share computing resources as if they were located on the same local network.

The latest ConnectLAN 100 Brouters offer several enhancements over previous models, including the ability to offer local as well as long-distance bridging and routing capabilities.

"We also added a new internal fiber-optic modem option that permits transmission speeds up to 2M bit/sec over fiber-optic cable," said Richard Otto, Halley's technical support manager. Earlier models could also support 2M bit/sec but not over fiber.

ConnectLAN 100 Brouters also support several new software features. "One optional package we're offering is the Brouter Control System software that gives users network management capabilities for any of the Brouters on their networks," Otto said.

These network management

capabilities include enhanced load balancing and load sharing, programmable control of network message routing and transparent alternate routing support. Specifically, ConnectLAN 100 Brouters can support up to 32,000 IEEE 802.3 Ethernet nodes on one extended wide-area network, Otto said.

They feature protocol transparency, meaning that they pay attention only to the second, or data-link, layer of the International Standards Organization Open Systems Interconnection model protocols. ConnectLAN 100 Brouters ignore all upper layer protocols, such as the Transmission Control Protocol/Internet Protocol, Digital Equipment Corp.'s DECnet, Xerox Corp.'s Xerox Network Systems and OSI. The result is that multi-vendor Ethernets can be interconnected, Hughes said.

ConnectLAN 100 Brouters also feature automatic configuration, which enables them to "self-learn" node addresses and adapt to any node address additions and deletions automatically. "This feature eases network growth and change without expensive downtime for network reconfigurations," Hughes noted.

Start-up diagnostics, fault detection and recovery are provided automatically by the ConnectLAN 100 Brouters to ensure network reliability.

ConnectLAN 100 Brouters will be available in the first quarter of 1989. Specific pricing has not yet been determined. The ConnectLAN Brouter Control System costs \$2,000 and is available immediately for use with the older ConnectLAN Brouters.

For further information, contact Halley Systems at 2730 Orchard Pkwy., San Jose, Calif. 95134, or call (408) 432-2600. □

Proteon router ties Ethernet, token ring

Low-cost p4100 device designed for networks supporting Novell NetWare or TCP/IP protocols.

By Laura DiDio
Senior Editor

WESTBOROUGH, Mass. — Proteon, Inc. last week introduced a low-cost router designed to integrate Ethernet and token-ring local network environments supporting Novell, Inc.'s NetWare or TCP/IP protocols.

The p4100, targeted at small and midsize businesses, also supports wide-area network links at speeds up to 64K bit/sec.

"The p4100 serves the existing market of users who want to expand their wide-area networks into remote office locations but can't afford the \$12,000 or more it costs to interconnect," said Mick Scully, Proteon product marketing manager.

"Applications for wide-area networks are growing very fast — electronic mail alone justifies interconnection," Scully said. "The p4100 is priced starting at \$5,385, and that makes it affordable for a lot of smaller and medium-sized users."

The Intel Corp. 80286 micro-

processor-based p4100 has four network interface slots that support IEEE 802.3 Ethernet (both thick and thin), IEEE 802.5 token-ring and Proteon's own ProNET-4 and ProNET-10 local networks.

The device can be configured with as many as three synchro-

"Applications for wide-area networks are growing very fast," Scully said.

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nous RS-232 or RS-449 wide-area network ports at speeds up to 64K bit/sec.

The device comprises two network adapter cards, the operating system software and the protocol forwarder to handle the

(continued on page 18)

LANMARKS

BY JAMES THORNTON

Network of nets may be answer to standards glut

At a time when network options are multiplying, the challenge for vendors is to meet user needs for performance and standards without adding to existing confusion.

Network debates today concern everything from wiring — broadband, baseband, fiber and twisted pair — to the merits of higher level protocols such as the Transmission Control Protocol/Internet Protocol and those defined in the Open Systems Interconnection network model.

The battles over these standards are based on sincere disagreements among informed people over significant, though sometimes arcane, technical points. Debate and options are healthy, but when shots are fired in technical wars, innocent users can be caught in the crossfire.

The computer industry has come a long way from its origins in stand-alone data processing centers to today's distributed computing environment. This rise in departmental computing has been aided by the growth in special-purpose computer systems and new networking technologies.

But the specialized needs of departmental users run counter to the desire of systems managers for consistency. Industry standards are a way to address this conflict by encouraging vendors to agree on common features.

Standards are desirable for many reasons but principally because they simplify purchasing, installation, training and maintenance while giving users the assurance of a future network growth plan. They also reduce vendor and user costs.

(continued on page 18)

Thornton is chairman and chief executive officer of Network Systems Corp. in Minneapolis.

Standards group to be proposed for 802.3 hubs

By Laura DiDio
Senior Editor

BOXBOROUGH, Mass. — Interlan, Inc. and BICC, PLC, the UK parent of BICC Data Networks, Inc., are scheduled to propose today the formation of a standards body to address the management of IEEE 802.3 Ethernet network hub devices.

Joint proposal

The two companies will make the joint proposal at an IEEE plenary tutorial in Phoenix, according to Joseph Skorupa, Interlan's director of product planning.

"We're putting out feelers to determine how much interest there is from other vendors for a hub standard covering such devices as multiport repeaters, wiring concentrators and synchronous fiber-optic hubs," Skorupa said.

According to Skorupa, man-

agement of network hub devices is becoming a matter of increasing concern for users and vendors alike.

"Users are quickly moving toward structured wiring in their facilities, and the hub is a critical component in the network," Skorupa said.

"Consequently, the ability to remotely manage, configure and control these devices becomes more important," he said.

Ethernet shortcomings

Interlan and BICC said they will also bring up the shortcomings of the present IEEE 802.3 Ethernet standard.

"We want to address the fact that the IEEE 802.3 Ethernet does not today possess comparable or robust network management capabilities like the 802.5 token-ring standard," Skorupa said.

According to Skorupa, today's

Ethernets do not provide any standard method for activating and deactivating links between networks.

No standards

"On a multiport repeater, there's no standard way to enable or disable a particular port if problems arise," Skorupa said. Users today have to physically disconnect cable or flip a switch on the repeater itself once they locate the problem.

The companies proposed the creation of a standard for hub management because, Skorupa said, "Our hope is that we can come up with a network management feature that will allow users to locate problems and reconfigure the network to maintain service directly from the management console."

"At the very least, we ought to be able to bring the IEEE 802.3 Ethernet standard up to par with the 802.5 token-ring capabilities," he explained.

For more information, call Skorupa at Interlan at (508) 263-9929, ext. 314. □

Network of nets may be answer

continued from page 17

Even defining what a standard is can be difficult. Reality forces us to deal with two types: official standards, which are defined and monitored by organizations such as the Institute of Electrical and Electronics Engineers and the Consultative Committee on Telephony and Telegraphy, and de facto standards such as IBM's Systems Network Architecture, which emerge when many users adopt one particular standard.

Some people think that official standards are flawed because the process of debate and compromise weakens technological elegance or performance.

Critics of de facto standards argue that they hold users hostage to the vendors sponsoring the standard. But the fact that no single standard solves every need is no reason to discount the benefits offered by individual standard.

The ultimate goal behind standards — at least from the user's perspective — is the ability to run any kind of software on any kind of hardware and share the information with any location — in short, total interoperability.

every company says it is committed to supporting OSI. But vendors are already introducing their own versions of the standard, which virtually assures that multiple versions will exist.

Moreover, throughout the industry, people are debating whether or when OSI will replace TCP/IP.

The reality is that hundreds of customers are happily using TCP/IP and will continue to do so for quite some time. Vendors cannot force them to change.

The only reasonable response the industry can offer users facing multiple network standards is to provide a way to integrate those standards (as well as the varied computer equipment and media) into an efficient enterprise network.

Network of networks

This is the shape of networking in the 1990s: not a single, universal standard to which every vendor and user will have to comply but a fully functional "network of networks."

Router ties E-net, token ring

continued from page 17

Transmission Control Protocol/Internet Protocol and Novell's Integrated Packet Exchange (IPX) routing protocol, a Layer 3 protocol. In addition to Novell NetWare networks, p4100 users can interconnect different vendors' TCP/IP-based networks, such as those from Banyan Systems, Inc. and Sun Microsystems, Inc., Scully said.

"By early 1989, we will also provide support for XNS-based nets like 3Com Corp.'s 3+ Open and [DEC's] DECnet as well as other standard protocols, like OSI," he said.

When used in conjunction with Proteon's ProNET-10 local network, the p4100 enables users to integrate various local networks on a 10M bit/sec ProNET-10 backbone and support links to remote networks.

This configuration would make it possible for users to centralize their file and print servers on the ProNET-10 in order to simplify network administration, Scully said.

Traditionally, he noted, if a user in one department is moved to a location served by another network, the user's files have to be transferred to a different file server.

"Using the p4100 router to form a ProNET-10-based backbone allows file and print servers to reside on the token-ring backbone and lets users access their files from anywhere on the network," Scully stated.

Additionally, local networks that do not have servers but are connected to ProNET-10 backbones by p4100 routers can access network services through the backbone.

The p4100 is fully compatible

with Proteon's larger p4200 router. When used together, network managers can integrate networks in a "hub and spoke" topology.

In this scenario, p4100s can be used at the end of spokes to link up to three individual local networks and support a network feed to a p4200 hub.

The single, centrally located p4200 would in turn provide access to other local networks as well as wide-area connections to other buildings, campuses, cities or states, Scully said.

Because the p4100 implements the Simple Network Management protocol, it works with the company's OverView Network Management System.

The p4100 is fully compatible with Proteon's larger p4200 router.

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The p4100 will be available in mid-December. The base unit, which includes two interface cards, is priced at \$3,750.

Additional individual interface cards range from \$545 to \$1,245, and the TCP/IP and IPX software modules cost \$500 each.

Bundled, preconfigured packages containing the base unit and specific network interfaces and software modules range from \$5,395 to \$6,295.

For further information, contact Proteon at 2 Technology Drive, Westborough, Mass. 01581, or call (508) 898-2800. □

Netnotes

continued from page 17

ceiver or cable fault by supporting alternate routing.

FTEL is targeted at applications in which any interruption of service is unacceptable, Alantec President Michael Kalashian said in a prepared statement.

The FTEL adapter card is connected to two separate Ethernet cables via independent transceivers. All FTEL nodes transmit and receive using the primary port and primary cable. In the event of a transceiver fault on Port 1, the adapter immediately switches to Port 2. If the cable fails, every node switches to the second port and second cable.

FTEL is available immediately for Novell, Inc.'s NetWare environments and other interfaces are planned for 1989. In single-unit quantities, FTEL is priced at \$750. The product also carries a \$10,000 user fee, which covers up to 20 users and includes an Alantec SMARTBridge and associated software.

Alantec can be reached at 101 Hammond Ave., Fremont, Calif. 94539, or call (415) 770-1050.

Hyundai Electronics America is scheduled to introduce an entry-level local network at Comdex/Fall based on Novell's ELS NetWare software. The package will include a Hyundai Super-286 nondedicated file server and up to three Hyundai PC Terminals, which are low-cost diskless workstations. The package also includes Ethernet interfaces and coaxial cable necessary for installation. The suggested retail price of the turnkey network starts at \$9,979.

Hyundai is located at 166 Baypointe Parkway, San Jose, Calif. 95134, or call (408) 473-9200. □

Constant struggle

But many factors interfere with that goal. In fact, the drive for standards reflects a constant struggle to reconcile the desire to encourage innovation and higher performance with the imperative to preserve existing investments in equipment and training.

Total interoperability is something the computer industry may never achieve. Perhaps it should not try. But the price the computer industry pays for its mixture of standards is confusion and uncertainty among users.

Easing that uncertainty should be treated as a high priority among suppliers of hardware, software and networking.

One approach to relieving uncertainty and preserving investment is to acknowledge the validity of different networking approaches and to then provide users with a way to integrate those standards.

Each of the official and de facto networking standards is appropriate and beneficial in its own right and for its own applications. But what happens when a user needs to connect different systems or work groups operating on different standards?

The answer to the user that has four different networks cannot be to standardize on one of them and throw away the other three.

That would be too expensive and time-consuming and might not improve overall performance.

Likewise, the answer cannot be to wait until all vendors agree on all aspects of a universal networking standard. Does anyone realistically think that will ever happen?

OSI is a case in point. Nearly

Most importantly, a network of networks must be modular and easily expandable.

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What is the desirable architecture for a network of networks?

First, it should recognize that a network is not defined simply by a medium, a protocol or the equipment connected. It must transcend these limited definitions and be defined by the user's needs and the problem to be solved.

Second, the network should function as a single computing entity incorporating interconnected nodes. These nodes can be identical or different, adjacent or distant and linked by any of several media. A powerful networking engine should assume functions once reserved for host computers — such as media interfacing, I/O buffering and protocol processing.

Third, the high performance demands of emerging networks require a network that can handle concurrent, rather than one-at-a-time, transfers of data.

Most importantly, a network of networks must be modular and easily expandable — able to accommodate multiple computer systems or networks, to interconnect different transmission media and to handle communications between different protocols.

The industry has made great strides in effectively networking computers. Networking networks is next. □



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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Worth Noting

The University of Mississippi's Center for Telecommunications in University, Miss., recently won a \$250,000 grant from BellSouth Corp. A spokesman said the center will use the money to support classes, seminars and conferences in telecommunications policy and to provide additional faculty.

Dialogue

Two recent surveys suggest that support for nonproprietary networking systems — such as Open Systems Interconnection — will grow tremendously over the next few years. What are your plans, if any, for implementing open systems?

"I anticipate that within the next four to five years we will migrate to Open Systems Interconnection. We are working toward it now. In fact, in our plans, OSI is the key element to improving connectivity and enhancing our network.

"There is so much diversity in networks today that OSI undoubtedly will play a major role in the future."

Lionel Gillerman
Manager of
network technology
McDonnell Douglas
Aerospace Information
Services Co.
Cypress, Calif.

"We don't have any concrete plans for OSI. We will evaluate it when we get clear of the many projects now on our schedule. We're basically an IBM shop and pretty satisfied.

"It really doesn't matter if other companies begin implementing OSI. We're pretty independent and work on our own."

Sam Stafford
Director of corporate
telecommunications
Supermarkets General Corp.
Woodbridge, N.J.

(continued on page 24)

How to react when a key worker threatens to leave

By Wayne Eckerson
Staff Writer

In an age of declining employee loyalty and growing demand for trained network professionals, communications managers often must deal with employees who have received lucrative job offers from other companies.

Managers interviewed by *Network World* agreed it is important to sit down with an employee to find out workers' reasons for wanting to leave before bidding them farewell or making a counter offer.

In many instances, an employee who is considering a job offer is dissatisfied with some aspect of his or her present job. Managers who talk with employees can uncover these dissatisfactions and take steps to address the problems, sources said.

"It is not always money that lures people away. That may be just the tip of the iceberg. Employees can be dissatisfied by poor management, lack of direction or responsibility, or some

other aspect of their working environment," said Norbert Gottenberg, an executive recruiter for Russell Reynolds Associates, Inc. in New York. "It is incumbent upon managers to put these issues on the table. The manager can then address the problem and perhaps keep the employee from leaving."

"I have an open-door policy with my employees," said George Tabback, director of corporate information systems with Ingersoll-Rand Co. in Woodcliff Lake, N.J. "We try to resolve their problems if possible within the company. I try to help them understand how their job offer squares with their career plans and what they are committing themselves to."

Tabback said one of his employees, a proficient technical support worker, was considering an offer for a higher paying job at another company because he had just moved into his own apartment and was having difficulty

(continued on page 24)

GUIDELINES

BY ERIC SCHMALL

Shuffling employees: a very delicate task

Of all the changes a telecommunications manager can make, none has as much potential to help or hurt as a departmental reorganization.

Whether driven by larger organizational upheavals, budget cuts or the redefinition of the role of telecommunications, shuffling people and their responsibilities presents a massive challenge. Done effectively, it can reenergize the group to achieve difficult tasks. If done poorly, its effects on morale and productivity can be cataclysmic.

When a king dies, the traditional cry "The king is dead. Long live the king!" reflects news that is both solemn and reassuring. The old monarch has passed on but the structure remains unchanged. A reorganization signifies a similarly profound change.

A reorganization is not the simple replacement of one individual with another but the fundamental redistribution of tasks, responsibilities, roles and relationships within a group. For each person involved, it raises the uncomfortable question: What will happen to me?

Managers must be sensitive not only to this deeply felt concern among subordinates but to the manner in which they orchestrate a change.

There are two common approaches to reorganizing a group. One technique, rooted in autocratic styles of management, places decision-making solely with the manager. The opposite method involves more participation from subordinates, including solicitation of their opinions, suggestions and, sometimes, approval.

The autocratic manager decides upon the organization's new structure and reapportions roles with minimal consultation. He works out what he feels is best for each person relative to the

(continued on page 24)

Schmall is network systems manager for an insurance holding company.

Networks at the International Stock Exchange

Topic	Videotex stock price feed that supports 9,000 individual subscribers, 225 bulk data feeds to brokers and newspapers, and satellite feeds to selected international subscribers.
Stock Exchange Automated Quotation (SEAQ)	Network that specialists use to input their own quotes, read quotes from other specialists, review bids and ask for particular stocks.
Stock Exchange Automated Execution Facility (SAEF)	Stock order-entry system that allows traders to buy or sell up to 1,000 shares automatically (should be on line early next year).

SOURCE: INTERNATIONAL STOCK EXCHANGE, LONDON

Int'l Stock Exchange preps new networks

ISE automates transactions to keep traders from being lured away by electronic trading systems.

By Barton Crockett
Senior Writer

LONDON — The International Stock Exchange (ISE), based here, is set to unveil a new generation of networks it hopes will solidify its position as one of the world's premier financial trading centers.

The networks include one that electronically executes trades and others that automate the clearing and settlement of stock purchases. The ISE hopes these network services will encourage traders to continue working with the exchange rather than using electronic trading networks offered by vendors.

Such electronic trading networks obviate the need for traders to use an exchange by letting them negotiate and finalize deals among themselves. A growing number of companies, including stock quote vendors like Reuters Holdings PLC, also based here, are offering these services.

In recent years, for example, Reuters purchased a trading network, called Instinet, that handles trades in U.S. stocks, and the company announced plans to build another one, called Globex, to handle evening trading in futures at the Chicago Mercantile Exchange.

"Since stock quote companies already control the information base, they could easily take volume away from stock exchanges with electronic trading systems," said Richard Mason, a graduate professor in information technology at Southern Methodist University's Edwin Cox School of Business in Dallas.

"Of course we view these companies as a competitive threat," added Peter Giles, head of advanced technology with the ISE.

By early next year, Giles said, the exchange hopes to cut over two new networks. One is called Stock Exchange Automated Execution Facility (SAEF). This net-

work consists of 2,400 or 9.6K bit/sec leased lines running from brokerages and other trading houses to fault-tolerant computers run by the ISE. Traders will use SAEF to electronically route and execute small buy and sell orders through the exchange.

The other is called SEQUAL. In the SEQUAL network, traders in international equities markets will use terminals linked by leased lines to the exchange to report finalized trades for automatic clearing and settlement.

Currently, traders must telex to each other the details of any

SEAQ prompted traders to leave the exchange's trading floor in droves.

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trade and review these telexes to make sure such things as price and number of shares sold are accurately reported. Traders then telephone the exchange to report, clear and settle trades. According to Giles, this can take days. SEQUAL, he said, will cut this process to a few seconds.

The ISE already has firsthand experience with the power that networks wield to lure traders away from traditional exchanges.

Two years ago, the ISE developed a network called Stock Exchange Automated Quotation (SEAQ) that prompted traders to leave the exchange's trading floor in droves.

SEAQ automates many tasks performed by so-called specialists, those who match buyers with sellers, distribute price quotes and buy or sell stocks to keep

(continued on page 24)

French users group spurs big carrier to new heights

By Barton Crockett
Senior Writer

PARIS — The French users group, AFUTT, plays a pivotal role in getting France's monopolistic carrier to improve its international competitiveness.

Unlike most U.S. users groups, the Association Francaise des Utilisateurs du Telephone et des Telecommunications (AFUTT) is intimately involved in drafting policies that govern its primary carrier, France Telecom. The group also works closely with the carrier to develop new services, according to AFUTT's founder and executive director, Jean-Francois Berry.

"We have regular meetings with the director general [of France's Ministry of Posts, Space and Telecommunications] throughout the year," Berry said. "Over the years, about half of our suggestions have been adopted."

This rapport did not always

exist. Berry said he founded AFUTT nearly 20 years ago to lobby the French government to increase funding for an underdeveloped communications net.

"At the time, several services were missing that were available in other countries," he said. "We founded AFUTT to convince the government to invest more in telecommunications." Berry said the effort was successful and that France has continued to invest sizable sums in leading-edge telecommunications applications.

AFUTT is by far France's largest and most influential telecommunications users group. The organization has more than 600 member corporations, each of which pay between \$850 and \$10,000 for membership. The group also has 13,000 individual consumers who pay a much smaller fee.

The group holds regular local membership meetings and spon-

sors an annual convention. Primarily, however, it specializes in lobbying France Telecom for reforms favorable to users.

Among the victories the group can claim, according to Berry, is a 10-year battle it waged to convince France Telecom to itemize long-distance bills. Berry said

A top issue for AFUTT is convincing France Telecom to reform its pricing structure.

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AFUTT won on this front in 1983.

He said France Telecom had refused to issue itemized bills because it believed this would decrease consumption and increase complaints as users garnered more information about their actual calling habits.

In practice, Berry said, the opposite has been true. Itemized

billing has reduced complaints because consumers now know where they are spending their money. It has also increased traffic because consumers are no longer worried about spending more than they expect on telephone service.

Among the top issues on AFUTT's agenda now, according to Berry, is convincing France Telecom to reform its pricing structure. Currently, prices for local and long-distance calls vary enormously depending on the size of a local calling area. AFUTT wants these rates standardized.

AFUTT is also lobbying France Telecom to loosen restrictions on leased lines. For instance, while users can lease lines for value-added data services, they cannot lease lines for voice services, Berry said. He also said AFUTT wants France Telecom to cut charges on leased lines crossing national boundaries in Europe.

"Currently, these lines are much more expensive than a similar line would be in the United States," he said. "There is no technical reason for this. It's all in the administrative costs." ■

Shuffling employees

continued from page 23

needs of the group. This manager works in isolation, but, as a courtesy, he may disclose changes to those most affected prior to making the official announcement.

Much can be said for this approach. It's quick, simple and decisive. It works well where decision-making is highly centralized. Even so, there are steep slopes to this method's downside.

It can quickly alienate subordinates who believe in having a say in their careers. This approach has trouble correcting itself.

When a manager unilaterally announces a major change that sparks negative reactions, the situation quickly transforms into a win-or-lose proposition. The issue shifts from who should do what to who will lose face.

Some managers, having encountered the unpleasant consequences of the autocratic method, have embraced the participative model. This calls for a great deal of discussion between the manager and staff about individual responsibilities, goals and how the new organization should be structured. The manager then builds the new organization with attention to everyone's interests. Such a change is designed to produce a group with a strong allegiance to the organization and the manager.

Unfortunately, this method can produce a great amount of anxiety among the individuals involved as discussions drag on. Over-analysis sets in. Before long, the manager appears to be weak and indecisive. Grand solutions designed to please all end up antagonizing all instead.

Most managers adopt a synthesis of these two styles. Few managers today maintain complete authority on these matters. Fewer still run their organizations as pure democracies. The ideal approach is to identify the style that is most consistent with the current management philosophy and organizational culture.

No matter what style or approach, department employees deserve sound leadership in the process. Since reorganization represents such profound changes, those changes should never be treated lightly.

Focus and dedication

A reorganization should never be put on the back burner. It requires focus and an unyielding dedication to comprehensive action. To announce the death of the old organization and then linger over how to structure the new one could prove to be a grievous mistake.

Inordinate delays when reorganizing spawn rumors and speculation. They foster internal cynicism that erodes confidence in the new organization. Whether an autocrat or a democrat, no manager can afford such a situation. ■

Int'l Exchange preps new nets

continued from page 23

markets running smoothly. At the ISE, as many as 10 to 20 specialists compete with each other for business in a particular stock.

Specialists use SEAQ to enter their own price quotes, to record bidding and asking prices for stocks and to monitor price quotes from competing specialists.

Armed with this tool, many specialists found it easier to transact business from their own offices, using the telephone, rather than from the exchange floor. As soon as eight months later, Giles said, the ISE found its equities trading floor largely abandoned.

"If you walk down to our equities trading floor, you'll see it's pretty much empty," Giles said. "Most of our traders don't even work down there anymore."

According to Giles, SEAQ helped the ISE lure traders away from other exchanges in Europe by making specialists more efficient. Yet it also put the ISE in the position of competing largely on the basis of networks, rather than on the prestige of a large trading floor.

This, in turn, has made the ISE vulnerable to competitive challenges from stock quote purveyors like Reuters and other companies that choose to sell electronic trading systems.

In this battle, Giles said, the ISE feels it can beat any electronic trading system by offering superior liquidity. In other words, the ISE can make it easier for traders to execute trades by giving them a bigger market, in terms of money spent and number of traders, than its competitors. ■

Dialogue

continued from page 23

"We're taking a wait-and-see approach. We're using IBM's Systems Network Architecture, and it is serving our needs well. We gain connectivity outside of SNA with IBM's XI interconnect, which allows X.25 to ride on SNA."

Phillip Evans
Director of telecommunications
FMC Corp.
Dallas

"We don't have to be on the leading edge of technology. Any new application needs to fit into our business strategy, and we have to understand it and be comfortable with it. Maybe in two years we will be ready to evaluate OSI."

"Standardization would be the best thing for the industry, but it's not going to happen in two years. You've got the big players lined up in support of OSI, like IBM, but it is not enough to make it a reality. It's like Integrated Services Digital Networks. We investigated ISDN last year, but now it seems to have died off."

George Tabback
Director of corporate information systems
Ingersoll-Rand Co.
Woodcliff Lake, N.J.

"There is no question that OSI-based products will grow significantly. We are going to implement X.400 voice-messaging gateways to outside service bureaus by the end of the first quarter of 1989. Over a period of time, we will develop intracompany use of X.400."

Peter Donaghy
Manager of user services and support group
Hughes Aircraft Co.
Long Beach, Calif.

When a worker threatens to quit

continued from page 23

paying his bills.

"When we sat down and talked, it was clear that the position he was offered involved management responsibilities he was not yet ready to handle. We discussed opportunities within the company that were suited to his skills and yet would pay him more money. He ended up taking a job elsewhere with our company," Tabback said.

Some managers find that employees who leave for a position that seemed irresistible are often disappointed.

"Some employers and headhunters talk a great game but offer a lot less than they promise. I have had a couple of former employees tell me they are sorry they left," said Sam Stafford, director of corporate telecommunications at Supermarkets General Corp. in Woodbridge, N.J.

If an employee's only motivations for leaving are more money and perquisites, there is often little managers can do, according to Mei Ling, director of international telecommunications for Manufacturers Hanover Trust Co. in New York.

"One of my employees based in London got an offer that would pay her 30% more than we were paying, plus a car. We just parted on good terms because our company couldn't possibly match that," she said.

Ling said it is a bad management practice for a company to get in the habit of making counter offers, except for extremely valuable employees.

Ling said the practice encourages employees to go out and get offers in order to improve their

standing within the company.

"If a person comes and talks first, we can discuss issues and perhaps work out some kind of salary package with them. If they have an offer in hand, it is usually too late," she said.

"Corporate loyalty is dead in the '80s. I used to think that was a bad thing because it adversely affected morale and showed a lack of integrity. But it hasn't hurt American business," said Skip Tolette, director of Information Technology Management for Johnson, Smith & Knisely, Inc. in New York.

"Some employers talk a great game but offer a lot less than they promise," Stafford said.

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"We are at a point where workers are more interested in improving their individual careers than standing by a company," said Glen Carlson, vice-president and manager of Electronic Network Products for First Interstate Bank of California.

Carlson added that if employees are less loyal, companies often give them good reason to be.

"Businesses are doing a lot of things for their own benefit these days that sacrifice the interests of their employees. Companies often cut their staffs through layoffs in order to improve their operating expenses," Carlson said. "You can't blame employees for looking around because they are less certain their jobs are safe." ■

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

See inside for:

- Lachman Associates' software bridge that connects local-area nets via an ISDN circuit
- Unit from Digital Products that lets SNA-connected devices and IBM Personal Computers share an asynchronous printer

First Look

Racal-Vadic boosts modem net mgmt.

Racal-Vadic, Inc. announced last week that it has doubled the capacity of its dial-up modem network management system and enhanced its call-back security system by giving it matrix switching capabilities and other features.

The **MDS II** dial-up network management system now supports 16,000 central-site dial-up modems residing in as many as 512 intelligent chassis daisy-chained together. This is up from the previous maximum of 8,192 modems residing in 256 chassis. Each chassis passes network management information via a dedicated connection to a **VA9000 System Controller**, which is an IBM Personal Computer-based network management workstation.

The VA9000 permits net managers to configure modems, conduct tests, diagnose problems, detect and isolate faults, manage inventory and statistically analyze the activity for each modem or intelligent chassis in the dial-up net.

Racal-Vadic's **VA930** call-back security system, which fits into any slot on a VA 1690 or VA 1682 intelligent chassis, has been enhanced to allow controlled dial-up access to different host computer systems or applications at a central site. With the new matrix switch mode, dial-up users employ system codes to select a particular host or application to which they want to connect and then hang up the phone. The call-back system

(continued on page 28)

Firms unveil software for factory floor

By Jim Brown
New Products Editor

CHICAGO — Stratus Computer, Inc. and Motorola Computer X, Inc., a Motorola New Enterprises division, last week released software that supports communications between Motorola Computer X factory floor device controllers and Stratus XA 2000 Continuous Processing System minicomputers.

In an announcement at the AutoFact '88 show here, the companies said the software will enable users and systems integrators to build applications that support program-to-program links between Motorola Computer X and Stratus computers.

The unnamed software consists of two modules: one running on a Stratus XA 2000 minicomputer and one running on a Motorola Computer X cX real-time processing microcomputer. The two systems must be linked to the same Ethernet local network running Transmission Control Protocol/Internet Protocol. The modules translate commands used by the Motorola Computer X

and Stratus devices.

Both the Motorola Computer X and Stratus computers can be linked to Manufacturing Automation Protocol-compatible nets.

The software will enable Motorola Computer X cX-based applications to access Stratus-resident data. It also enables Stratus minicomputers to collect data from Motorola Computer X's cX microcomputers and forward it to other systems in the factory.

Motorola Computer X's cX microcomputers run the company's cX operating system, which supports Unix-based applications. It features a VME bus, which allows for connection of factory floor devices. Several cX microcomputers can be linked together via a Motorola Computer X proprietary 1M bit/sec token-bus local network.

These cX microcomputers provide the instructions needed to operate process control monitors, automated material-handling devices, robots, computerized numerical controllers and automated testing applications being run on the factory floor.

Stratus' minicomputers are transaction processors used to control a manufacturing plant or an area of a plant. For instance, a Stratus minicomputer can download factory floor device control programs to Motorola Computer X cX microcomputers. Those pro-

(continued on page 28)

Speech Plus' low-end VGS links phone users to data

High-end VGS software offers PROFS access.

By Jim Brown
New Products Editor

MOUNTAIN VIEW, Calif. — Speech Plus, Inc. last week introduced a low-end version of its CallText Voice Gateway System (VGS), which enables callers with push-button phones to access computer-resident data.

The company also released software for its high-end VGS that enables callers to access data stored in IBM's Professional Office System (PROFS) software running on IBM VM-based mainframes.

Unlike the company's other VGS products, the new VGS Digitized Voice (VGSdv) product uses only prerecorded words when translating computer data into voice messages. The VGSdv consults a list of prerecorded words and assembles the correct word string in response to a command entered from a telephone keypad. The VGSdv will also translate numbers into corresponding spoken words.

The VGSdv supports applications such as account inquiry, in which bank customers can obtain

information about their accounts. Users store a list of often used responses on the VGSdv that are digitized at 32K bit/sec using adaptive differential pulse code modulation and stored on a hard disk.

The larger VGS units support both prerecorded voice messages and text-to-speech synthesis, which translates digital data into spoken words.

A single VGSdv supports between four and 32 voice ports. It links to IBM mainframes and System/3X minicomputers, as well as to asynchronous hosts via an RS-232 interface. Software running on the VGSdv enables the unit to emulate an IBM 3274 cluster controller, IBM 3278 terminal, IBM 5251 terminal or asynchronous terminal.

A Speech Plus DevelopIt application generator helps users build voice response applications. The VGSdv also includes Speech Plus' SpeakIt software language and a single text-to-speech port that is used during application testing.

(continued on page 28)

T-1 mux reroutes lines before failure

General DataComm also introduces remote net management device based on Sun workstation.

By Jim Brown
New Products Editor

MIDDLEBURY, Conn. — General DataComm, Inc. recently announced a high-end T-1 multiplexer capable of monitoring line conditions and automatically rerouting traffic when user-defined thresholds are exceeded.

The company also released a new network management product that enables central-site network operators to monitor and control nets consisting of different General DataComm products.

The new T-1 multiplexer, the Megamux Transport Management System (TMS), can support as many as 28 T-1 lines — expandable to 100 T-1 lines by next year — and includes the Intelligent Automatic Rerouting software. As many as 128 Megamux TMS nodes can be used in a net.

The Megamux TMS builds on General DataComm's current high-end T-1 product called Megaswitch. The new hardware uses the Megaswitch technical design but has a new cabinet with more shelves and supports more processing power. The hardware will support the same interface boards used with existing General DataComm T-1 multiplexers.

The additional processing power supports the Megamux TMS Intelligent Automatic Rerouting software, which enables users to define operating thresholds for each T-1 circuit. When circuit conditions approach the threshold, the software will automatically switch to a predetermined alternate route.

This is different from other multiplexers, which reroute only failed lines, according to Don Young, General DataComm's vice-president of marketing.

The Intelligent Automatic Rerouting software can also be configured to use data compression techniques, such as adaptive differential pulse code modulation (ADPCM), to ensure all channels from a failing T-1 line can be supported by spare capacity on existing T-1 lines. ADPCM digitizes voice at 32K bit/sec, allowing a 64K bit/sec DS0 channel to support two voice conversations instead of one.

Alternatively, channels within a T-1 can be given priority over other channels, meaning a channel from a failing T-1 line will take the position of a less important channel on the backup T-1, preventing transmission of that less important channel.

Megamux TMS software sup-

ports a network modeling feature that enables users with a Megamux TMS Controller, which is a Zenith Data Systems Z-386 PC attached to a diagnostic port, to see how configuration changes will affect a network before actually implementing them.

The multiplexer supports General DataComm's existing Combined Digital Aggregate board, which makes the unit compatible with AT&T's Digital Access and Cross-Connect System (DACS) standards. DACS compatibility enables users to route DS0s at central office switch sites from one T-1 line to another.

A user, for example, can instruct a central office to extract a 56K bit/sec channel embedded within a DS0 channel from a T-1 and then route it to a remote loca-

When traffic nears the threshold, the software switches to an alternate route.

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tion via an AT&T Dataphone Digital Service offering. Users can also use central office-based channel bank equipment to route incoming analog 800 calls to the user's central site via T-1 lines.

The Megamux TMS continues to support General DataComm's proprietary bandwidth-allocation scheme. This enables users to configure certain T-1s to support multiple data channels at speeds other than the 64K bit/sec standard DS0 rate. The scheme comes at the expense of DACS compatibility at the DS0 level.

General DataComm is currently developing an Integrated Services Digital Network Primary Rate Interface for the Megamux TMS. The company is also working to make the multiplexer compatible with AT&T's subrate data multiplexing (SDM) standard. SDM enables a single 64K bit/sec channel to support multiple 2,400 bit/sec, 4.8K bit/sec or 9.6K bit/sec subrate channels.

A network of Megamux TMSs can be controlled via a central-site Megamux TMS Controller. In addition, each network location can monitor its own multiplexer using an ASCII terminal.

(continued on page 28)

The guys at Polaroid to shoot each other



Picture it. Polaroid had people in 11 locations. Up to 62 miles apart. All needing access to central files and applications.

Their network was making information access anything but instant. !@\$%+&*#! Trouble.

So Polaroid called in NYNEX. And we responded with an advanced Centrex LAN system.

The results? They've centralized corporate applications while providing online access to mainframe, mini and PC users company-wide. Terminals, PCs and telephones plug into the same phone jacks. Their maintenance burden is greatly reduced. And with the 1.5 megabyte T1 links our Centrex system provides, there's plenty of room for growth.

In short, Polaroid is achieving wide area service with local area

roid were ready her.



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AT&T unveils software to link PMX, X.400 networks

BOSTON — AT&T's Data Systems Group recently announced software that enables its 3B2 minicomputer-based AT&T Private Message Exchange (PMX) electronic mail package to transmit messages via CCITT X.400-compatible public networks.

The product, called AT&T Mail PMX/X.400, converts AT&T PMX mail messages to the X.400 format. It was announced at the recent Electronic Mail Association meeting here. Converted messages can be transmitted via X.400-compatible public networks, such as AT&T Mail and Telecom Canada's Envoy 100.

PMX/X.400 can be used in conjunction with AT&T Mail Ex-

change software running on the same 3B2 minicomputer. AT&T Mail Exchange converts E-mail messages received from such packages as IBM's Professional Office System, Digital Equipment Corp.'s All-In-1, Hewlett-Packard Co.'s HP Desk and Wang Laboratories, Inc.'s Wang Office to AT&T PMX format. Once converted to PMX format, PMX/X.400 can convert the messages to the X.400 format.

AT&T Mail PMX/X.400 ranges in price from \$4,995 to \$6,995.

AT&T's Data Systems Group can be reached by calling (800) 367-7225, ext. 4153. Users can also contact their local AT&T account executive. ■

Low-end VGS links users to data

continued from page 25

Both SpeakIt and the text-to-speech port translate data to speech while an application is being tested. This eliminates the need to record prototype messages each time a change in the application is made.

VGSdv units can be upgraded to larger VGS units that support text-to-speech synthesis on each of up to 32 ports.

A VGSdv supporting four ports costs \$23,500, and a version supporting eight ports costs \$27,900. The DevelopIt application development software costs \$9,800.

The software linking VGS to IBM PROFS is called Audio Email. The package runs on a dedicated VGS and enables PROFS users to access PROFS Notes and PROFS Calendar information from push-

button telephones.

The VGS unit running Audio Email uses text-to-speech synthesis to enable callers with a push-button phone to listen to a summary of PROFS Notes messages, which include information such as the author of the message, the date, the time and the subject. Based on that information, callers can choose to listen to an entire message or skip to the next one.

Callers can also choose from a list of predefined messages that can be sent in response to a PROFS Note. However, callers cannot use Audio Email to generate new PROFS messages.

Audio Email will spell names instead of pronouncing them. Another feature of the software enables callers to instruct the VGS

unit to spell a misunderstood word. Callers can also review their schedule by accessing PROFS' Calendar function. Audio Email also provides an audit trail listing the number of calls received and the duration.

Audio Email makes the VGS unit appear to an IBM host as if it were an IBM 3274 cluster controller. The VGS system running Audio Email links to an IBM mainframe via a coaxial cable connection operating at up to 9.6K bit/sec.

The cost of a VGS unit running Audio Email and supporting four simultaneous links to PROFS is \$44,700. The product can be expanded with additional hardware to support 32 simultaneous PROFS links.

Speech Plus is located at 640 Clyde Court, P.O. Box 7461, Mountain View, Calif. 94039, or call (415) 964-7023. ■

Firms unveil software

continued from page 25

grams are used by the microcomputer to instruct a robot to make different parts of a product, for example.

Stratus minicomputers can also run software that supports finite scheduling, inventory control, material tracking, quality management, preventive maintenance, process control and real-time data collection.

Additionally, the Stratus minicomputer can be linked to other networks in the factory, including an IBM Systems Network Architecture network supporting a mainframe running the factory's business applications. It can also be attached via Ethernet to engineering workstations and can support an X.25 wide-area network link.

With the link to Motorola Computer XcX systems, the Stratus minicomputer can track the

flow of factory floor operations and report that data to the factory's larger systems.

For example, if a Motorola Computer XcX microcomputer application detects that the supply of raw materials at a manufacturing station is low, it will send a message via Ethernet to a companion application running on the Stratus minicomputer. The Stratus-resident software will interpret the message and consult a data base to find out if any of that raw material is available elsewhere in the factory.

If the raw material is found, the Stratus application can send a message to the operator of another system asking that the raw material be delivered to the manufacturing station. If the raw material is not available, the application can instruct the IBM mainframe to generate and transmit an electronic data interchange purchase order to a supplier.

In another example, an engi-

neering workstation can download a product design change to the Stratus minicomputer. The Stratus minicomputer can then download a program to a Motorola Computer XcX microcomputer, which then instructs the robot to modify its operation to support that design change.

Both firms also announced that SBI Corp., a systems integrator in Fort Wayne, Ind., will be developing applications using the new software.

A Stratus XA 2000 Model 50 configured to support the new software costs \$86,000, and a Motorola Computer XcX microcomputer configured to support the software ranges in price from \$27,450 to \$34,585.

Stratus is located at 55 Fairbanks Blvd., Marlborough, Mass. 01752, or call (508) 460-2796. Users can reach Motorola Computer X at 1201 E. Wiley Road, Suite 100, Schaumburg, Ill. 60173, or call (312) 576-8950. ■

Mux reroutes lines before failure

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Megamux TMS Controllers can be installed at up to six different network sites, with users designating which of the six is the primary controller. The primary controller will support the entire network configuration data base, while secondary controllers monitor line status and perform diagnostics on remote devices. Megamux TMS Controller operators can exchange messages with each other via electronic mail.

Users can also link the primary Megamux TMS Controller to an IBM Personal Computer running IBM's NetView/PC, which will convert Megamux TMS alarms to an IBM host-based NetView net management system. General DataComm is currently developing software that will enable NetView/PC to convert commands entered from a NetView console to the commands used by the Megamux TMS Controller.

General DataComm also released the Megaview Integrated Network Management system, which is based on a Sun Microsystems, Inc. workstation running Unix. Users can link the Sun

Users can trade in their equipment and upgrade to Megamux TMS for \$1,500.

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workstation to the diagnostic ports of central-site General DataComm Megamux TMSs, modems, multiplexers and packet switches that are linked to remote Megamux TMSs, modems,

multiplexers and packet switches. An Integrated Alarm Manager collects alarms from each network, enabling a central-site operator to monitor several General DataComm networks.

Users of General DataComm's existing T-1 multiplexers can trade in their equipment and upgrade to the Megamux TMS for \$1,500. Megamux TMS pricing starts at \$17,000 for a cabinet with one shelf supporting two T-1 links.

General DataComm will begin the controlled introduction of the Megamux TMS in the first quarter of 1989, and general availability is slated for the second quarter of 1989. The Megaview Integrated Network Management system, including the Sun workstation and software, is expected to sell for \$36,395 when it ships in the second quarter of 1989.

General DataComm is located at Route 63, Middlebury, Conn. 06762, or call (203) 574-1118. ■

First Look

continued from page 25

consults a data base to ensure the user has access to the host or application and dials the user back.

The VA930 has also been enhanced to allow the system's user data base to be backed up onto an IBM Personal Computer floppy or hard disk for storage or for uploading to other VA930s. The new feature eliminates the need to manually input data base information when an additional VA930 system is added. All audit trail data can likewise now be stored on a floppy or hard disk.

The enhanced VA9000 System Controller costs \$3,500, and the VA930 call-back security system sells for \$2,995. Both are being sold at pre-upgrade prices and will be available at the end of the month. Upgrade charges for current users vary.

Racal-Vadic, Inc., 1525 McCarthy Blvd., Milpitas, Calif. 95035, or call (408) 432-8008. For upgrade information, call (800) 482-3427.

Bridge links local nets via ISDN circuit

Lachman Associates, Inc., a Unix software developer, last week introduced a software bridge that connects local-area networks via an Integrated Services Digital Network circuit.

Called the **ISDN-LAN Bridge**, the product links different local-area networks that are running the Transmission Control Protocol/Internet Protocol across dial-up ISDN lines. The Lachman bridge connects local networks with ISDN lines instead of AT&T's Switched 56 services or a dedicated 56K bit/sec Data-phone Digital Service leased line.

The ISDN-LAN Bridge consists of Lachman's PC/386 Unix ISDN Driver software, an ISDN Basic Rate Interface board, Lachman's System V Network File Server and Lachman's System V Streams TCP.

The Basic Rate Interface board plugs into microcomputers using Intel Corp.'s 80386 microprocessor.

Lachman's Network File Server is based on Sun Microsystems, Inc.'s Network File System, and System V Streams TCP was jointly developed with Convergent Technologies, Inc.

The Lachman ISDN-LAN Bridge is available now for computer and telecommunications manufacturers, service providers and high-volume end users.

Prices for end-user versions range from \$500 to \$1,500.

Lachman Associates, Inc., 1901 N. Naper Blvd., Naperville, Ill. 60540, or call (312) 505-9100.

Unit lets SNA devices, PCs share printer

Digital Products, Inc. recently introduced a unit that enables IBM Systems Network Architecture-connected devices and IBM Personal Computers to share an asynchronous printer.

The **NetCommander 10G subLAN** product supports up to 16 ports. An IBM 3174, 3724 or 3276 cluster controller can be attached to one port via a coaxial cable connection, while a departmental laser printer can be attached to another via RS-232 or RJ-45 connectors. Up to nine Personal Computers can also be attached via RS-232 or RJ-45 connectors.

The product includes a 3287 SNA printer protocol converter that enables the laser printer to appear to SNA devices as an IBM 3287 or 3289 printer.

The product can store print jobs in a buffer when the printer is busy. That buffer can range in size from 250K bytes to 2M bytes. The product price depends on buffer size and ranges from \$2,495 to \$3,795.

Digital Products, Inc., 108 Water St., Watertown, Mass. 02172, or call (617) 924-1680. ■

IBM displays are getting attached to DEC, Data General and Prime® computers.

The fact is, IBM® 3151 ASCII displays are getting attached to all kinds of multi-user systems.

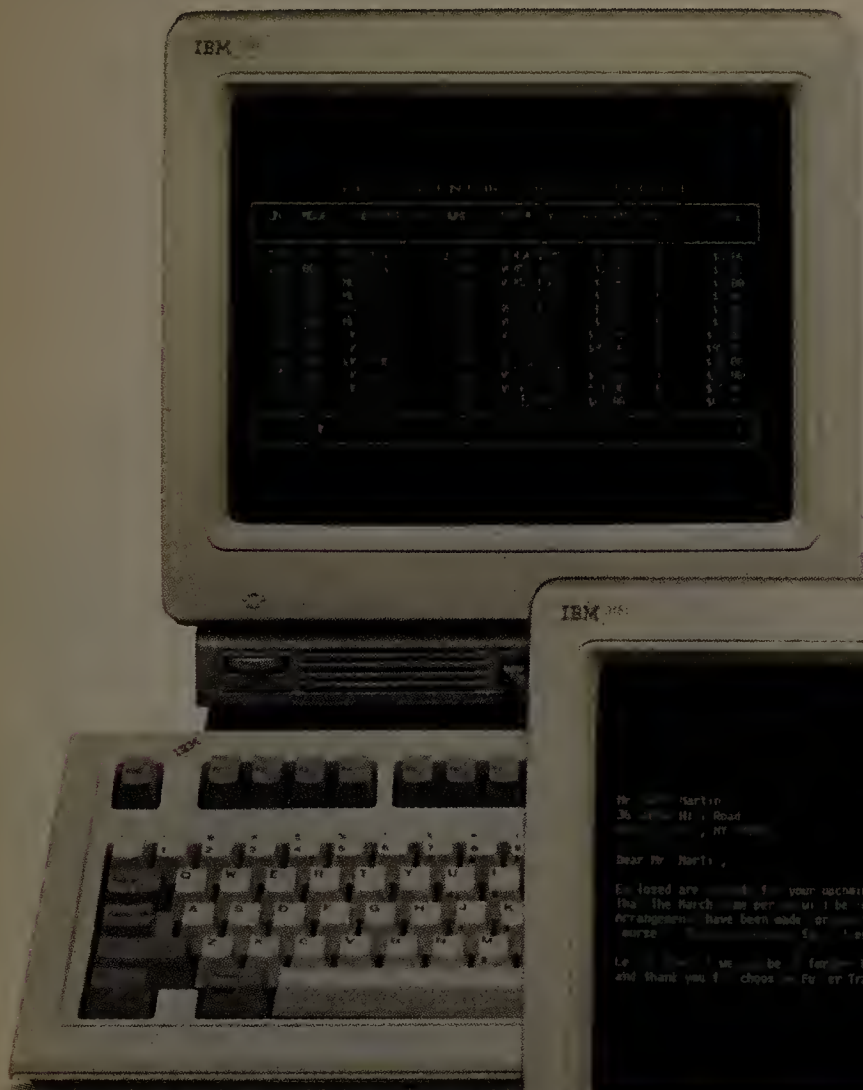
It's not surprising. IBM 3151 displays are inexpensive both to buy and own. Model 160 starts at \$399*, including one-year warranty. Other models are available with a 3-year warranty. Add an IBM Maintenance Agreement, and you'll get five years of IBM service for just \$54.

The 3151 family of displays provides most of the popular emulations compatible with DEC,™ Wyse,® Data General,™ TeleVideo® and more. Models 310 and 410 utilize unique cartridges which provide additional capabilities: auto dial, PC compatibility and concurrent dual host connectivity.

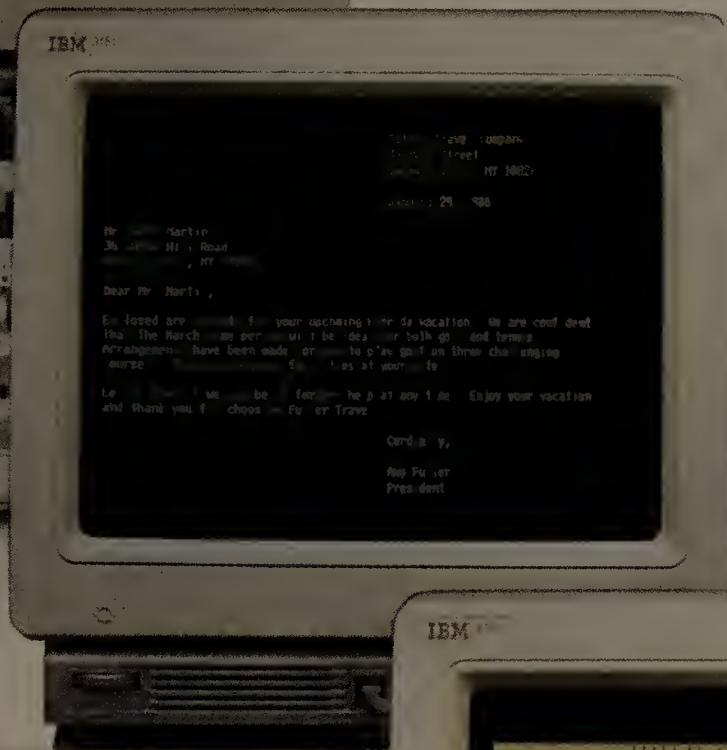
IBM ASCII displays are everything you'd expect from the company that ships more terminals than anyone. All models are equipped with high-quality IBM keyboards, designed for use with your ASCII applications. Non-glare 14" flat screens in green or amber/gold provide crisp character resolution.

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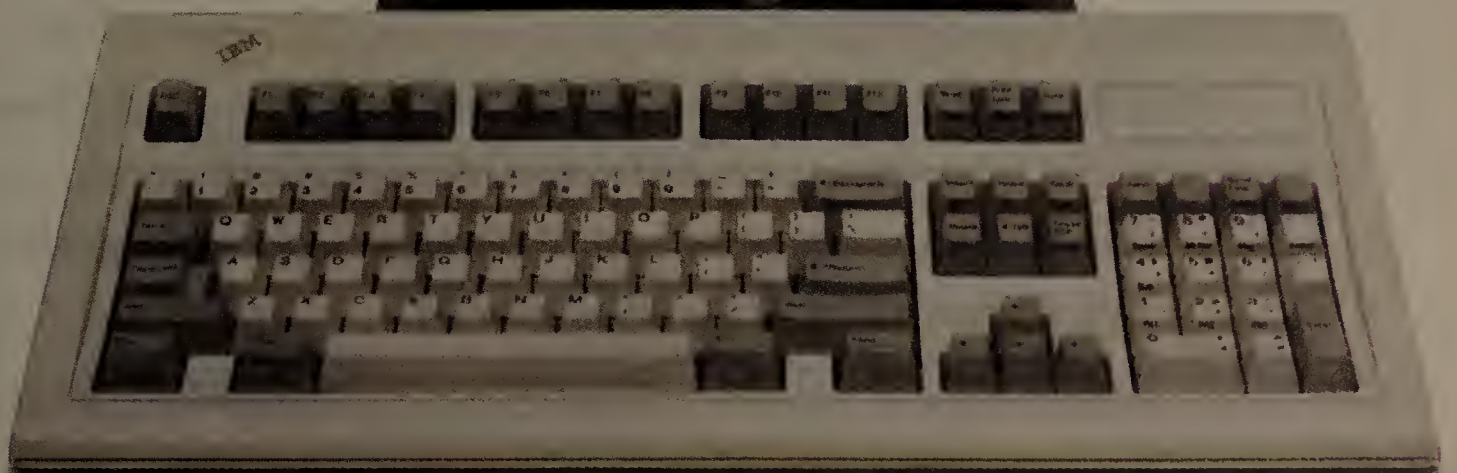
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OPINIONS

STANDARDS

BY JOHN MCQUILLAN

Standards help vendors more than they help users

Major network suppliers are paying more attention to standards than ever before, and considerable effort is being expended for the standardization of the higher levels of the Open Systems Interconnection model. But it is useful to consider exactly whom standards help.

It is widely believed that standards are more helpful to users than to vendors because they allow users to interconnect otherwise incompatible equipment. However, if standards are not part of the user's requirements from the beginning, it is a mistake to choose an inferior product or to pay more money for a product of the same quality just because the product meets certain standards.

There are two main problems with standards as seen from the user perspective: the existing investments users have made and the pace of change in the networking field. No one ever redesigns a network from scratch. Everyone is faced with an investment in prior generations of technology that must be retained. In such an environment, a commitment to standards is a radical proposition. It means making a departure from the continuous evolution of proprietary solutions and making an effort to reach a totally standardized solution within a specified period of time.

Few organizations outside of the government have even attempted such a departure. Even in the government, these kinds of initiatives have proven far more difficult than the planners had imagined.

In the long run, by a gradual process of replacing proprietary solutions with standard solutions as each reaches the end of its usefulness, some users may be fortunate enough to one day arrive at an all-standard environment.

But that is where we come to the second objection: Technology moves so quickly that the standards-setting process always lags behind. It is unrealistic to expect that each new technology — hardware, software or application — will be subjected to a complete standardization effort before it is commercially viable. In fact, most leading-edge technologies are useful for business application long before they are standardized.

To forego these technologies until they are fully standardized is virtually to give up the opportunity to use them to gain a competitive advantage. It means being content to play catch-up with competitors who have already embraced them.

The real winners

The truth is that communications standards, especially those at OSI Layer 4 and above, are primarily useful for the vendor community because, by permitting the interconnection of a vendor's products and services with those of other manufacturers, they increase the market reach for suppliers that have smaller installed bases and smaller sales forces.

The largest and most powerful vendors in any given market segment are usually somewhat reluctant to take up the banner of standards because they recognize they will get little or no benefit from the widespread introduction of standardized products.

Adherence to standards is not a viable strategy for vendors by itself. A vendor that claims to believe strongly in standards may actually be insufficiently innovative in producing proprietary products and services or may have insufficient market presence. Such a vendor may feel it necessary to fall back on adherence to internationally developed rules for protocols and interfaces.

Thus, it would seem that all the discussions about standards tend to miss the fundamental point: Standards help everyone, but they help vendors much more than they help users. ■

McQuillan is president of McQuillan Consulting in Cambridge, Mass. He assists users and vendors in planning future communications systems.

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EDITORIAL

Fiber optics will reshape the networking landscape

Rapid deployment of fiber-optic technology in local- and wide-area networks will have truly revolutionary effects on the communications industry by the year 2000. That was the overriding message for attendees of the recent Newport Conference on Fiber Optics Markets, held in Newport, R.I., and sponsored by Kessler Marketing Intelligence Corp., a Newport-based market research and consulting firm.

At the conference, Institutional Communications Corp. Chairman Scott Brodey spoke of the potential for a nationwide total bypass network. Entrepreneurs are building high-capacity fiber-optic backbone networks and teleports in nearly every major U.S. urban area. Some independent urban fiber networks already offer not merely bulk bandwidth but a wide range of dedicated and switched telecommunications services, including point-to-point digital data services, 800 services and credit card services.

If local fiber networks in major cities joined in a nationwide consortium, they could bypass both the regional Bell holding companies and the three major long-haul carriers. These independents could link themselves by forming agreements with independent long-haul fiber carriers in some areas and by using satellites or securing rights-of-way to construct their own long-haul fiber trunks in other areas. Or, they could even cut a deal with one of the big three.

In the view of another speak-

er at the conference, Brodey's scenario belies the predictions of futurists who say that advanced communications technologies will lead to a decline of large cities as corporations migrate to cheaper and less crowded rural areas.

According to Mitchell Moss, director of the Urban Research Center at New York University, fiber-optic networks are to urban growth today what the interstate highway was in the 1950s

high-bandwidth services — will go first to large corporations in major urban areas and last to companies in rural areas.

Fiber is also driving revolutionary changes in local-area nets. Single-chip implementations of the Fiber Distributed Data Interface will cost between \$200 and \$2,000 by 1994, predicts Bert Williams, strategic marketing manager at Advanced Micro Devices, Inc. in Sunnyvale, Calif.

The imminent availability of low-cost FDDI products, combined with the Electronic Industries Association's choice of multimode 62.5-micron fiber as the standard for fiber backbones in commercial buildings, enables network managers to plan now to progressively replace older media with fiber.

Also, plastic fiber appears to be the medium that will bring fiber to the desktop and end the reign of twisted-pair wiring, says K. Scott Gordon, president of Via Informationways, a consulting firm in Princeton, N.J.

Plastic fiber is insensitive to electromagnetic radiation, yet, according to Gordon, it supports the same transmission distances as twisted pair and its connectors are no more costly. While plastic fiber now costs more per foot than twisted pair, prices are expected to drop rapidly.

Given all the impending changes that will result from applications of fiber optics, forward-thinking network managers will learn as much as they can about the technology — as soon as possible. ■

Plastic fiber appears to be the medium that will bring fiber to the desktop and end the reign of twisted-pair wiring.

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and the railroad was in the 1870s. Cities that have access to multiple long-haul fiber-optic systems will succeed in evolving from manufacturing centers to information hubs, Moss says, because they can provide competitive advantages to companies located within their boundaries.

The most important such advantage may be availability of fiber-optic local-loop facilities. Absent any regulatory mandates to the contrary, fiber — and by extension, video and image transmission services and other

OPINIONS

DATA COMMUNICATIONS NEEDS

BY HOWARD GUNN

What telecom vendors don't know about data users

When attempting to integrate telecommunications and data communications at the desktop, in the switch and in the transport media, an important factor usually is overlooked: What do data communications users want and need?

The impetus for voice/data integration comes from experts who provide telecommunications equipment and services. These specialists have a profound understanding of voice customers. However, the needs, objectives and expectations of data communications users are vastly different.

Telecommunications vendors and service providers must dispel their misperceptions about data communications before they can be successful at integration. Telecommunications suppliers believe that data communications users suffer from inefficient, uneconomical, unmanageable and inflexible data networks; that a data network's usefulness is limited by a lack of standards; and that the myriad of proprietary workstations, personal computers, networks, protocols and transport technologies makes it impossible for users to communicate with one another.

Wrong.

The RS-232 and RS-422 connections are about as standard as you can get, and so is the IBM 3270 environment. Thus, a physical and logical solution like Integrated Services Digital Network doesn't impress data communications users. Furthermore, hybrid information networks already connect all relevant computer combinations and can give data users all the network, transport, session, presentation and application layers of flexibility they need.

These hybrid networks, driven by sophisticated, intelligent network processors, can be composed of any combination of proprietary workstations, transport networks, protocols and computer hosts. They use public, private and switched transport facilities when necessary, and they let users access any attached resource regardless of its physical location.

Telecommunications people must understand that data com-

munications users are part of a company's computer investment. Typically, they have between \$0.5 million and \$12 million in computer and data communications equipment investments with more innate intelligence, memory and software applications than a telephone company central office. But they don't share the telephone company dream of an intelligent network.

A second misconception telecommunications vendors seem to have is that data users do not have the capability to manage their networks easily. On the contrary, data communications users today can exert a great deal of control over the networks and information flowing

Telecommunications vendors and service providers must dispel their misperceptions.

▲▲▲

over the transport facility. Management, security, diagnostics and repair capabilities are literally at their fingertips. They install, operate and repair more complex equipment than a telephone company maintenance force can even imagine, and vendors are developing increasingly comprehensive network management applications.

A third area of concern is ISDN and Signaling System 7 networks. Telecommunications vendors must stop believing that the data network architecture is deficient because it puts all the intelligence in the peripherals. The data network exists expressly to transport information between these peripherals, and if these vendors continue to believe that multimillion-dollar computer installations and millions of personal computers are just peripherals, they are ignoring reality. Their customers' computers have intelligence because that's where they process the information they need to run their businesses. Even dumb terminals have intelligence: the human being at the keyboard.

Today, these intelligent devices don't interact with the local telephone exchange because

data users don't believe that is necessary for them to be able to perform most of their data communications.

Fourth, providers of telephone company-based network services don't understand which applications the public switched network satisfies and which the data networks satisfy. These applications have very little in common. The data communications user sees the public switched network as a means to create relatively random connections between geographically distinct locations, where the source of the request and the destination have only one thing in common: They want to communicate with each other.

On the other hand, data networks are based on computers. Those who send or receive information from an application, or who pass information between applications, are usually located at known physical locations. Most computer owners take great pains to secure every physical access point into their data communications network. They get a bit queasy about attaching a random connection generator like a central office to their network. Vendors and service providers who don't take this into account won't make much headway in data communications.

Finally, data communications users believe that private-line networks cost too much, although, in most cases, they are not inordinately expensive, compared with the alternatives. When the dial network is more economical for the application and security is not a concern, data communications users gladly use the public switched network. But they also compare these transport costs with the cost of another computer and often implement a distributed processing computer or data concentrator as an alternative to switched and private lines.

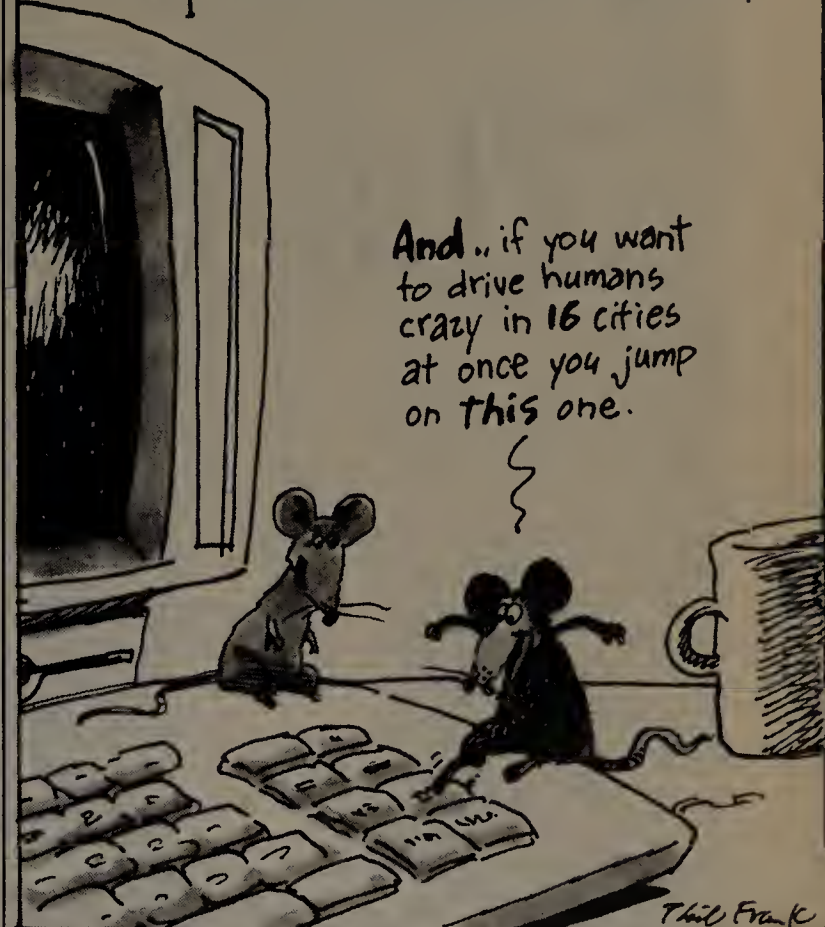
Data networks move information to a desired destination. From the data communications user's point of view, there is no reason — except cost per bit or cost per hour — to put a random-connection machine in the transmission path. Until telecommunications vendors and service providers truly understand the purpose and nature of data communications, their efforts to integrate voice and data or to implement ISDN face bleak prospects. ■

Gunn is vice-president of corporate strategy for Gandalf Technologies, Inc. in Wheeling, Ill.

TELETOONS

BY FRANK AND TROISE

Suspicious Confirmed # 29



LETTERS

User Excellence

On behalf of Al Crawford, senior vice-president, and the entire staff of American Express Travel Related Services Co., Inc.'s (TRS) worldwide telecommunications department, we offer our sincere appreciation for the User Excellence Award.

We are very proud of the award, and the plaque is displayed for all to see. Your reporter did an excellent job in putting the article together ("American Express net puts users on top of the world," NW, Sept. 5).

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General incompetence

Your excellent editorial ("Distributed real-time applications will shape future") and Jim Innes' opinion column ("Ignorance is no excuse for vendor abuse") caused me to save the Opinions page from your Aug. 15 issue.

Innes' column was in response to your May 9 editorial ("Ignorance is no excuse for incompetent sales support"). Both columns missed the point entirely. Both communications users and vendors are
(continued on page 46)

Network World welcomes letters from readers. Letters should be typed, double-spaced and sent to Editor, Network World, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701.

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The bargain hunters

By ERIC GOTTESMAN

Buying used communications equipment is nothing new. But this market has recently begun to boom, and used equipment is becoming something of a commodity rather than a rarity.

Changing business and technology requirements are making large amounts of communications equipment obsolete. Mergers, acquisitions, relocations and reorganizations are changing corporate communications requirements almost overnight. That "ideal system" installed last year may not have enough capacity to serve a greatly increased user population.

Conversely, if the number of users falls sharply for similar reasons, the system may become underutilized. It may no longer make sense to keep that expensive Rolls Royce for an occasional drive around the block.

In either case, the network manager may opt to sell the old equipment and replace it with a system that more closely meets the new business requirements.

Changes in technology requirements may also necessitate the replacement of existing equipment with new systems to provide expanded features or improved performance. For example, modems are often displaced

Gottesman works as a telecommunications analyst in the New York area.

by a transition to digital networks and modem pooling. While some of this equipment may be placed in storage, moved to another lo-

cation or kept as a backup, many of the units are often sold, creating a used modem market.

Communications departments can accumulate a lot of extra equipment over the years. Small items such as telephone sets, answering machines and modems are common. Many times, no one even remembers the equipment until they stumble over it when looking for something else. Sometimes it's hardware that was planned for a system but never installed, or it's a unit cast off by a user, then rescued and thrown in a closet. There's an incredible amount of unused equipment that could be turned into cash.

The user with extra equipment has many options. Large organizations with many locations often move equipment from one site and

install it at another. Communications requirements may be similar at the two locations, requiring little or no system modifications.

Relocating equipment within a company can be advantageous because it can be done more quickly and less expensively than ordering new equipment. Small components such as telephones, modems and workstations are often removed, shipped and reinstalled within a few days.

Network managers who implement corporatewide equipment standards may find it particularly easy to swap equipment among various locations. If a specific need does not exist immediately, often the equipment will be placed in storage until needed.

Storing equipment provides users with readily available inventory. While most network managers want some inventory, the key is to have a workable amount ready at all times to meet most user requirements. Storing too much equipment can become costly when real estate expenses, environmental expenses (such as air conditioning and heating) and equipment depreciation costs are considered. At times, the storage costs can exceed the value of the inventory.

With communications equipment sales evolving into a commodities market, the opportunity for net managers to

sell used equipment is growing rapidly. According to George

Newman, communications leasing services manager at International Data Corp. (IDC), a market research firm in Framingham, Mass., there are now markets for private branch exchanges, key telephone systems, modems and multiplexers. There

(continued on page 45)

The used communications equipment market is a good place to shop and sell, if managers know where — and how — to look.

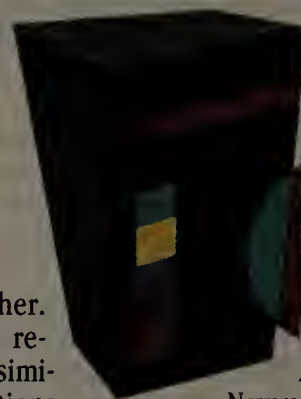




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Answers for the Information Age.

To lease or not to lease, that is the question...

CONTINUED FROM PAGE 1

uct, whether purchased or leased, because the discounts are passed through the lease to the user. Leasing in the high-tech industry is truly a user's market.

Effect of tax law changes

Changes in tax laws, especially the enactment of the Tax Reform Act of 1986 (TRA), have required a rethinking of acquisition and tax strategies. The TRA complicated the question of whether to purchase or lease. Many industry experts predicted that leasing would become more expensive as a result of the tax changes in the TRA. The passive loss rules meant that companies could no longer use losses due to depreciation to offset the amount of regular taxable income.

The rules raised costs for leasing firms, which own large amounts of depreciable equipment. And since the corporate tax rate was lowered from 46% to 34%, the impact of other deductions was reduced accordingly.

The elimination of the Investment Tax Credit, which let companies deduct 10% of the amount spent on equipment purchases from their taxable income, together with the new passive loss rules, considerably diminished the attractiveness of investing in leases as a tax shelter.

But elimination of the tax credit affected both purchase and lease economics equally. The Al-

Donovan is director of leasing planning services for IDC Financial Services Corp. in Framingham, Mass.



Tax reform and strong competition have thrown new complications into the lease-or-purchase decision.

ternate Minimum Tax (AMT) provisions also created new complexities for the owners of depreciable assets.

The AMT requires a company to calculate its tax using an alternate method in addition to the regular method. If the tax so calculated is greater than the regular tax computation, then the taxpayer must pay the higher AMT. To calculate the AMT, the taxpayer must add so-called "preference items" to its adjusted gross income. Examples of preference

items are certain aspects of accelerated depreciation; capital gains; tax-exempt interest; and one-half of the difference between income reported to shareholders (called pretax book income) and income shown on the company's Internal Revenue Service statement.

The AMT is then calculated at 20% of the revised adjusted gross income. The AMT would be paid if it exceeded the regular tax computation calculated at the standard corporate rate of 34%.

When writing off capital equipment for tax purposes, most companies use accelerated depreciation, which increases deductions in the earlier years of an asset's life and minimizes taxable income. For reporting book income to shareholders, most companies use straight line depreciation.

The use of accelerated depreciation and the differences between book depreciation and tax depreciation are two factors that commonly cause a company to be subject to the AMT.

If the company subject to the AMT is a lessor, it will be forced either to seek a higher rate for leases or accept lower profits to compensate for the increased tax. If the company subject to the AMT is a lessee, leasing reduces the impact of the AMT because rent payments, in contrast to accelerated depreciation, are not preference items.

The expected result of the TRA was that leasing would be more expensive for users. However, the increase in lease rates to reflect the tax change has not occurred. The common complaint from the lessor community is that profits are not what they should be because some companies are more interested in market share. Thus, strong competition in the marketplace, such as what is happening in the PBX arena, appears to be the reason for the attractive (from the user's point of view) current rates.

The competition in the market has made leasing attractive for users because they have so many
(continued on page 43)

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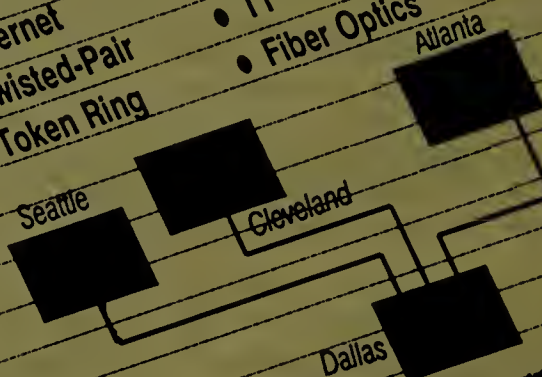
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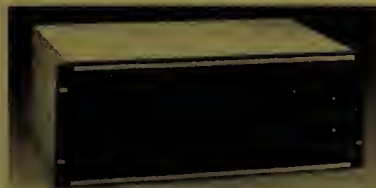
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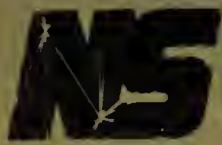
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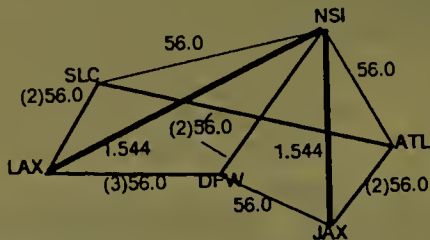
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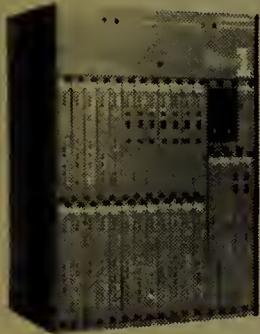
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options to choose from. Each individual user company has to decide whether to buy or lease based on its financial situation. It is imperative for communications managers to become more knowledgeable about the subject and consider leasing when in the market for new or used equipment.

Leasing pros and cons

The benefits of leasing communications equipment, as with any other high-tech equipment, include the fact that the risk of obsolescence and the risk of loss of market value remain with the lessor; no initial capital outlay is required; leases of up to five years can be structured as operating leases and thus need not be "capitalized" on the books of the corporation; and lease payments can be matched to projected income. Most important, given today's environment of highly competitive lease rates, a well-planned and well-negotiated lease can be the least costly option for users seeking a PBX product.

The negative aspects of leasing are that the overall cost of the product can be high, especially if the lease term is not well-planned; the benefits of ownership accrue to the lessor, not the lessee; and administrative costs in the form of revised documentation and lease costs on full payout midterm upgrades can be high, especially with a communications system that requires frequent additions.

Users that want to expand or upgrade a leased system must enter into a new lease with the original lessor, but they enter those negotiations with no bargaining power. They must either accept the lease on the lessor's terms or buy the additional equipment outright. Of course, the new equipment, once purchased, will be useless once the term of the lease expires. If it is necessary to make many changes to the equipment, then it is better for the user to simply buy it. The user must also consider the administrative costs of entering into a new lease, such as the cost of processing legal papers.

In the purchase or lease analysis, the key variable is the residual value of the equipment at the end of the lease. The residual value is affected by anticipated new product introductions; the relative improvement of the new product over the existing product; vendor support for its product on the used market; and the value of competitive products.

Other significant elements that affect the decision include the company's financial strategy, its long-range business plan and its long-range communications plan.

An ideal lease for a communications manager would be one in which the term of the lease would be the same as the term for the office space rented by the company, especially if the company does

not expect to extend its term of rental. In this theoretically ideal lease, there would be few or no additions or upgrades. At the other extreme, a lease for a term that had no relationship to the actual time the equipment was needed or to the expected introduction of new technology, coupled with frequent additions or replacements of equipment, would result in a very expensive situation despite an attractive initial lease rate.

The key to successful leasing is proper planning and negotia-

tively priced while the new or renewal lease may be more expensive. The leasing company uses its new, more expensive lease rates to offset the risk of not being able to remarket the old system. The user, in turn, has the benefit of flexibility.

The flexible-term lease originated in the computer side of the business. For those captive lessors (owned by their manufacturing parent) that offer it, the flexible-term lease has the added benefit of locking in a customer to the parent manufacturer's line

The key to successful leasing is proper planning and negotiation in advance for the possibility of a change in direction.



tion in advance for the possibility of a change in direction. The decision to lease and the terms and conditions selected must be made after an analysis of technical, financial and business requirements. All too often, users base their decisions on only one of these important criteria.

One significant benefit of leasing, outlined earlier, is that the risk of technological obsolescence remains with the lessor/owner. Recently, there have been few technological advancements in PBX products as vendors have reduced investments in new product innovations because of heavy discounting to gain market share. However, this strategy has not produced the desired gains in market share. Eventually, these manufacturers will turn to new technology and innovation. The subsequent advancements will have an adverse impact on residual values of existing equipment.

New voice and data applications will drive the market. The merging and modularization of various communications devices will occur between 1991 and 1995. If a company's technology plan calls for migration to these and other enhancements, the communications manager should consider leasing for existing equipment.

The manager who anticipates the need for new technology or more powerful systems should consider a flexible-term lease. Most leases, in which the user commits to a specific term, such as four years, cannot be canceled and, once in place, are expensive to modify.

The new flexible-term lease is a modern variation of the old "walk-away" lease that caused a few leasing companies to go bankrupt in the 1970s. The new flexible-term lease allows the user to walk away from an old lease on the condition that the user leases a new and more powerful system from the lessor. The initial lease is usually competi-

of equipment. The independent lessor hopes the added risk is offset by the potential increase in market share and the almost automatic renewal of business.

What to look for

Leasing companies range from large captive ones to small brokers that arrange leases by brokering the equity and debt components of a lease. Each type has its advantages.

Large captive lessors may be easier for users to deal with when trading up to a replacement system or making mid-lease additions and changes. However, in most cases, the captive lessor will not deal in other than its parent manufacturer's equipment. At the other end of the spectrum, small lessors are far more flexible in structuring a lease. They can

spend the time necessary to custom-develop a lease to meet a user's needs. Once the lease is completed, however, these small lessors may be more difficult to deal with when a user needs to make changes to the lease.

In the continuum are independent lessors of various sizes and specialties. Some are very large and provide a great deal of flexibility at slightly higher rates while others tend to specialize in certain segments of the market. In each case, the communications manager must determine the needs of the business and deal with companies that provide for those needs. At a minimum, the user that expects to establish a long-term business relationship with a lessor should check both its references and financial stability.

When deciding whether to lease or buy, the communications manager should not only consider the lease rate but also many other business, financial and legal aspects of the transaction. Changes in a lease may be required: The manager should address the costs and availability of adding or deleting equipment, terminating early or extending the term, and subleasing. The manager should also address the possibility of purchasing the system from the lessor at the end of the lease.

Although leases do not state fixed prices because of tax and accounting considerations, the lessor and lessee should agree on how to establish the current fair market value at the termination of the lease.

A purchase price committed to by the lessor that is deemed a "bargain purchase option" will cause the lease to be classified as a capital lease for accounting purposes. If the transaction does not meet certain criteria, the corpo-

rate accountants will have to classify it as a capital lease and treat the purchase on the corporate books as if it were capital equipment. Federal tax rules may also treat this transaction as a conditional sales contract and not a lease. This would further complicate the user's AMT situation and would defeat the purpose of the lease.

Finally, because of a lease structure called a wrap lease, a user may not be allowed a purchase option at the end of the user's lease. A wrap lease is one in which there are two lessors. The owner leases the equipment for a long period of time to a lessee that, in turn, functions as a lessor by leasing the equipment to another user for a shorter period of time. The first lessor actually owns the equipment; the user will not be able to buy it from the second lessor.

In conclusion, leasing is a viable method of acquiring communications equipment and should be considered by most users. The competitive atmosphere has increased since the TRA; the leasing industry complains that many transactions are, at best, marginally profitable. This fact makes for a very attractive lease rate from a user's perspective. Most of the profit made by lessors is in upgrades and other changes not anticipated by the user.

Communications managers should make an effort to understand the complexities of leasing. Key areas in which managers may need to obtain outside expertise are tax and accounting rules, legal principles, technology trends and the estimated value of the communications equipment at various times in the product's useful life. Leasing can be a useful tool in today's complex and competitive business environment. **Z**

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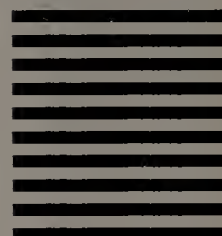
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The bargain hunters

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is also an emerging market for trading turn-
rets.

Vendors of all sizes are assisting users in selling their used equipment, particularly if it facilitates customer purchases of new equipment. Some large communications vendors provide secondary sales programs under which used equipment is purchased, reconditioned and resold to another end user.

Each program is different, but they generally provide standards for purchase, removal, reconditioning, certification, resale, installation and testing according to vendor procedures.

Secondary market programs are changing to meet the increase in used equipment sales. AT&T's program is evolving, says Al Toland, AT&T product pricing manager, "from a central core organization to individualized secondary market support groups for each product. Most AT&T products are available through used communications equipment dealers." Users interested in buying or selling used equipment should contact their local dealer directly for specific information.

Along with the vendor secondary sales programs, independent communications dealers also purchase equipment from users. There are hundreds of dealers, and their prices vary from week to week. It is a competitive, commodity-based market.

The National Association of Telecommunications Dealers (NATD) provides a data base for its members to match systems currently on the market with user requirements. The NATD, located in Washington, D.C., has 88 members nationally, many of which came from the buy/sell/lease computer equipment industry. According to Bill Pinkerton, NATD board member, the NATD was formed to raise professionalism, promote ethical trading of equipment, provide a collective voice for its members and educate the industry.

Network managers can also sell equipment through brokers. The Boston Computer Exchange matches buyers and sellers through an on-line nationwide data base and network of brokers. Although it handles primarily data processing equipment, modems and other network equipment are available. According to Alex Randall, president of the Boston Computer Exchange, the cost of the service is a \$25 listing fee plus 10% of the final selling price.

The Exchange quotes going prices for the items listed in its data base. Once a buyer has been found and the buyer's check has cleared, the Exchange instructs the seller to ship the equipment to the buyer. The buyer is then given 48 hours to inspect and test the equipment to determine if it is in good working condition.

To protect both the buyer and seller, the Boston Computer Exchange holds the buyer's funds in escrow until the equipment is received and tested. If all is well, the Exchange sends a check for the purchase amount, minus the service charge and commission, to the seller, and the deal is complete. According to Randall, 90% of the equipment listed is from users upgrading to newer systems and would be suitable for users with less sophisticated gear.

Trade it

Selling is not the only option for retrieving some of the equipment investment. Just as in the automobile market, some vendors allow customers to trade in used equipment toward the purchase of newer models.

Vendor trade-in (or trade-up) pro-

grams differ from ongoing secondary sales programs because they usually run for a limited time and are designed to promote sales of a specific product. For example, IBM dealers ran a trade-in program this summer to promote Personal System/2 sales. Users received from \$100 to \$1,100 for personal computers they traded in when purchasing a Personal System/2.

Nynex Business Centers, a group within Nynex Business Information Systems Co., have an ongoing trade-in program supporting a wide variety of communications products. According to Thomas Huber, marketing programs manager for the group, "When purchasing new equipment from Nynex, customers can trade in their old equipment and receive an allowance for up to 50% of the purchase price." Nynex immediately provides price quotes to customers on products it routinely han-

dles, and the company will provide a price quote within a few days on other communications equipment.

Vendor trade-up programs can be a convenient way to exchange old technology for new with plenty of vendor support. This doesn't always come cheap: The trade-in allowance can be far below market value. By trading in equipment, users can get all the support they would normally get with a new product. It's important to know what equipment is worth and whether vendor support is important to your company before making a trade-in decision.

Donate it

Donating used equipment to nonprofit organizations can also be quite beneficial. It may support a corporation's philanthropic goals and provide a tax write-off.

The key is to donate the equipment to an organization complying with Section 501 (C) 3 of the federal tax code. Donations to these organizations can be taken as charitable contributions.

The Global Technology Foundation in Boulder, Colo., is one example of a nonprofit 501 (C) 3 organization. The foundation accepts donations of computer equipment and then provides it to Third World countries. Phillip Friedman, president of the foundation, says the group accepts only equipment that is five years old or less, in good operating order and useful.

The foundation provides the equipment to recipients free of charge, except for shipping and operating costs. Friedman says the foundation is interested in working with communications systems. Anyone who would like to donate equipment can

(continued on page 46)

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contact the group at P.O. Box 486, Boulder, Colo. 80306, or call (303) 440-1115.

The costs

Before selling, trading or donating communications equipment, managers should know what impact their action will have on overall system life-cycle costs. The company's financial department should be consulted to identify the economic life of the system, depreciation schedule and projected salvage value.

It is important that the manager be aware of the current value of the equipment. Different vendors can make a range of offers for the same hardware. Managers should make sure that all components are identified by physical inventory or from the equipment maintenance contract and included in the vendor bid. Managers may want to check IDC's *Residual Value Forecasts*, which list values of specific equipment for each year of service.

During a communications system's economic life, the depreciation expense is taken as a tax deduction. If the equipment is sold before it is fully depreciated, the user loses the remaining deduction. Typically, users forecast what they expect to be the overall cost of the equipment, based on keeping it for its entire economic life. If, after a portion of that time, they find they must sell it, they can't take the depreciation anymore.

For example, if a PBX with a five-year economic life is sold after two years, only two years' worth of depreciation may be deducted, and the remaining three years of deductions are lost. This can raise the total system cost to users well beyond their initial forecast. Donating equipment to a charitable organization with a 501 (C) 3 tax status can sometimes be more beneficial financially than selling it because the donation can be deducted from the user's taxes as a charitable contribution.

The original forecasted salvage value, or the value users expect their equipment will have after a certain period of time, should also be compared with the actual return when the equipment is sold to compare projected and actual equipment costs. All fees involved in selling the equipment should also be included in the analysis.

Buy it

Many dealers now sell new and used equipment along with "nonused" equipment. According to John Gibb, sales manager for the AT&T Product Group at DATA 3 Computer Corp., a large communications equipment dealer in Bloomington, Minn., nonused equipment has never been used but is not purchased directly from the vendor.

Because new communications equipment has become a commodities market, dealers often buy new equipment in bulk from vendors or from one another. They then sell the equipment to users at market prices. A variety of telephone systems, components and replacement parts are available as nonused equipment.

The secondary equipment market, or the market for both nonused and used equipment, can offer real opportunities for managers to buy or lease quality inexpensive equipment. Gibb says one advantage of buying through secondary markets is quick delivery of merchandise.

Often the equipment is shipped and arrives within a few days of the order. Man-

agers buying equipment sometimes require quick turnaround times and don't want to keep a large inventory. The secondary market can provide in days equipment that takes weeks to receive when purchased through the primary vendor, because the process of buying from a primary vendor is so cumbersome.

Another advantage of buying used and nonused equipment is the price. Gibb says that price varies by product but typically users pay 70% to 80% of the list price. Currently, he says, PBX circuit cards for the AT&T System 85 and 75 are selling for

60% to 65% of the list price. Dimension and Horizon circuit cards are selling for around 30% of list price.

Gibb adds that some communications users prefer the secondary market for the level of service provided by the dealers. Users prefer to deal with them rather than with the primary vendors.

Along with the advantages of buying on the secondary market, there are also concerns. According to Gibb, you really have to know what you're getting, and you need someone who is technically qualified to make sure the system is in good working order. Otherwise, it's possible to get stuck.

Network managers should check warranty policies with the manufacturer before buying nonused equipment. It's important to determine if the product is coming through the manufacturer's distribution channels and if it's covered by the manufacturer's or dealer's warranty. It's also important to know the location where warranty work will be performed and who will be doing it.

Gibb recommends that users try the secondary equipment market but proceed with caution, build up a rapport with a dealer and stay with that dealer. Word of mouth, he says, is the best way to select a dealer.

Getting into it

Pinkerton says that communications managers' biggest concerns about the used equipment market are when and how to use it. He recommends considering the secondary market for system upgrades and staying one generation behind leading-edge users to take advantage of commodity price reduction. Newman of IDC says that it is currently a buyers' market for PBXs and that dealers are selling equipment inexpensively, hoping to make their profit on system additions, upgrades, service and maintenance.

Until ISDN is completely implemented, Newman says, many of the PBX systems are excellent values. With only a small percentage of PBXs currently switching voice and data, not everyone needs the latest models. Most users require only a PBX that will provide quality voice service today until Integrated Services Digital Network becomes a reality in their company.

Managers moving into the used equipment market need to work with reputable dealers and make sure that all details are

included in the contract. A good start is to work with an NATD dealer, since the NATD acts as an internal industry watchdog.

The purchase contract is crucial, says Newman. Spell out every detail, include a final equipment configuration and identify all performance requirements. Also include details on how maintenance will be provided.

Maintenance is a big concern with used systems. Typically, dealers bring the equipment in to inspect it, recondition it if necessary and replace all broken parts. If the user intends to have the primary vendor provide system maintenance, the system must be certified by the vendor before it goes to the user. Typically, the dealer's technician inspects it and reports the results to the primary vendor, which then decides whether or not to certify it.

By certifying the equipment, the vendor confirms the findings of the technician — that all parts are working — and that it is of a vintage and release that the vendor will support. Only certified






used equipment will be included in the vendor's service contract. An increasing number of reputable third-party companies will also provide maintenance, but many users with an imbedded base of equipment choose the primary vendor for all their service.

Vendors keep an inventory of parts for all their systems, but they become increasingly scarce as the equipment gets closer

to the end of its life cycle. Although older systems are less expensive, a parts shortage could reduce their maintainability.

The secondary equipment market is here to stay, and it's growing. This expansion means there is more merchandise on the market and better support from more dealers. And that's good news for savvy communications managers looking for the right equipment at the right price. □

Five of the largest NATD dealers

 Comdisco, Inc.	Rosemont, Ill.
 DATA 3 Computer Corp.	Bloomington, Minn.
 Econocom Telecommunications Corp.	Memphis, Tenn.
 Finalco, Inc.	McLean, Va.
 National Telecommunications Equipment Corp.	Farmington Hills, Mich.
NATD = National Association of Telecommunications Dealers	
GRAPHIC BY SUSAN SLATER SOURCE: ERIC GOTTESMAN, NEW YORK	

Letters

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staffed mostly with incompetents when it comes to users' operating needs and to the applications of communications, computer and control technology.

Too many vendors don't know their own equipment specifications, much less network interaction. Innes was right about the fact that few users know a key set from a modem. When the two meet, incompetent and ignorant users and vendors, there are bound to be problems. Too many firms are spending way too much money for equipment that is not going to do them any good and will be obsolete in a couple of years.

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Meteorologists need nets

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the NHC with additional observation data that is funneled to the Suitland complex from overseas weather services and from two additional weather station networks in Central America and the Caribbean.

The latter network, the Antilles Meteorological Network, uses a link that employs both undersea cable and microwave connections to carry a facsimile circuit and three Teletype circuits. Data from weather observatories is sent over the Teletype circuits to Suitland.

In turn, the Suitland center sends this data back down the line to other Antilles network stations with weather charts and NHC forecasts.

The mainframe-generated charts are also available to the NHC staff through facsimile connections. Forecasters can use both the on-screen chart displays and the hard copy in preparing their reports, Zimmer said.

Data sources

The forecasters also have access to two different networks for a mass of visual data and observations made by National Oceanographic and Atmospheric Administration (NOAA) satellites, which feed the data into the Suitland computers for processing.

One set of computers creates still pictures or partially animated pictures that are blowups of given sectors of the ocean. This data is sent to the NHC over five voice-grade lines leased from Contel ASC and AT&T, with Southern Bell Telephone & Telegraph Co. providing the local connection in Miami, said Zimmer.

The second image network, and the more sophisticated of the two, links two NHC workstations here with a dedicated computer in Suitland over 9.6K bit/sec data lines leased from AT&T. This computer creates animated pictures using the satellite data, he said.

In addition, the wind flow data used in the mainframe forecast models can be overlaid onto these images, creating a powerful forecasting tool, Zimmer said. A new 4381 IBM computer that will be installed this month will let the NHC staff focus more precisely on the tropical systems that are its special concern.

A fifth source for the forecasters is electronic sensor data beamed out by aircraft from the NOAA and the U.S. Air Force's Weather Reconnaissance Squadron. Readings of temperature, pressure and so on are beamed automatically to a satellite, then to Suitland, which passes the unprocessed data along to the NHC over leased Teletype lines.

These lines feed into a separate DG computer that plots the data, handles local processing and runs a remote job entry program. This program lets NHC

staff feed data about the hurricane back into the Suitland mainframes, which then incorporate that data into their programs.

Finally, the meteorologists talk by radio not only with their counterparts aboard reconnaissance planes but also with radio operators on oceangoing ships and even with ham radio operators, supplementing computer data with eyewitness descriptions of the storm's activity.

With all this information and some half-dozen different forecast models, the meteorologists arrive at their final forecast, Zimmer explained. The report is composed on the AFOS terminals for circulation throughout the network.

The AFOS net is also the primary means by which the NHC forecasts are made available to television newscasters and other outside sources.

The NWS offers these subscribers a menu of products, according to Phil Dales, chief of the international telecommunications section at the NWS headquarters in Silver Springs, Md. There are four classes of services: public products, such as forecasts and tornado warnings; domestic data; international data; and numerical products, including the forecasting models, both domestic and international.

In most cases, subscribers pay a onetime connection fee and a yearly maintenance fee to the NWS, Dales said.

Subscribers receive these products by ordering a connection from their local telephone company and then paying for the mileage from the NWS center to their own location.

Dales said he would like to see the Antilles network become a satellite-based communications network, a change that is apparently less of a technical problem than a political one.

The present network took three or four years to negotiate among all the Caribbean island nations involved, he said. Apportioning costs was the thorniest problem, and any plan to change the path of the circuits would disrupt that arrangement.

The NHC will be upgrading part of its satellite image processing capability this month, Zimmer said.

Instead of relying on the Suitland computer for the sophisticated image processing, the NHC will receive image data directly from the satellites and feed it to the new IBM 4381 computer.

The system will make it possible to zoom in on the tropical weather systems that are of particular interest to the NHC, Zimmer said.

Until this new system is installed — providing NHC staff with better satellite communications, combined information sources and interactive operations — the NHC will continue to rely on trained meteorologists to assimilate the information provided by the different communications links. ■

Big Blue shares its game plan

continued from page 9

The IBM Information Network has come a long way since it was introduced in 1982 mainly for "remote computing services" and time-sharing, Heaton said.

Because the international market that IBM is pursuing, particularly international EDI, is only beginning to emerge, IBM has an advantage in that it already has such a large international network constructed, analysts said.

"We found out relatively recently that international customers really don't recognize geographical boundaries," Heaton said. "But we don't think this has hurt us much. We've been pleased with what we've accomplished with the network so far."

John Reynolds, vice-president of operations for Communication Associates, Inc., a communications consulting and systems integration firm in Natick, Mass., said IBM's international strategy is sound.

"You have to have international reach," Reynolds said. "That's what [user] companies are looking for so that they can use EDI with their suppliers all over the world. That's why Tymnet and Telenet are so strong."

communicate with them in a Systems Network Architecture environment.

Increasing competition in the VAN market will lead some users to sign on with more than one network provider to take advantage of a variety of service offerings, Reynolds said.

According to Heaton, the Information Network has the potential to provide users with a va-



Syd Heaton

riety of custom and new services.

Heaton said he would not rule out the possibility of IBM offering disaster recovery services that

He said the network is currently used for disaster recovery in the respect that users send critical data to IBM computing centers for storage.

IBM does not, however, support hot sites where a user whose network or computer center is knocked out can relocate operations.

"The IBM Information Network would most likely play a major role if the company were to offer such a service, though," Heaton said.

While disaster recovery is up in the air as an Information Network service, Heaton said the network is being prepped as a conduit for Integrated Services Digital Network applications. IBM is currently conducting an ISDN pilot program with a domestic customer, Heaton said.

When the Information Network was first introduced, it served as a way for customers to remotely access IBM's powerful mainframe computers to perform application development work, to test new software products and to off-load data during peak load times of the year, he said.

The network was designed as a commercial offering, but it is increasingly serving IBM's own needs for E-mail and other applications.

IBM also has an internal network called Vnet, which IBM employees use for such purposes as sending E-mail.

The IBM Information Network currently serves about 250,000 end users worldwide. Their contracts range in value from less than \$100 a month to hundreds of thousands of dollars per month.

IBM Information Network users include Dun & Bradstreet Plan Services, the U.S. Railroad Retirement Board and Marshall Industries. ■

Heaton said he would not rule out the possibility of IBM offering disaster recovery services.

▲▲▲

Reynolds said his company has suggested to clients that they tie their mainframes into the IBM Information Network so that the consulting firm can easily com-

utilize the Information Network and would compete with the offerings of such vendors as SunGard Data Systems, Inc. and Comdisco Recovery Services, Inc.

"We choose the Codex 2382 modem when we're looking for transmission reliability at 19.2 kbps."

See us on page 51.

MCI unveils dedicated fax net

continued from page 1

credit card to charge facsimile transmissions from remote machines to their firm.

MCI is trying to position itself as a one-stop source for communications services, including voice and data network offerings, facsimile services and E-mail, said Tim Price, vice-president of sales and marketing at MCI.

MCI FAX is an attempt to gain a foothold in the burgeoning facsimile market. William McGowan, chairman and chief executive officer of MCI, said the company has identified facsimile as a key segment in the communications market. Revenue is projected to triple from \$3 billion now to \$9 billion in 1991.

Steve Sazegari, an analyst with Data-

quest, Inc., a research firm in San Jose, Calif., estimated the current facsimile market at \$2 million, with revenue growth likely to reach \$5 million by 1991.

Subscribers to the MCI FAX network should receive a number of benefits, according to Price. The network will support high-speed, error-free transmission of facsimiles, Price said. It will also provide higher quality than the analog lines generally used for facsimile transmissions, the company claimed.

But Sazegari questioned MCI's claims that it can offer higher facsimile quality. The transmission quality of the facsimile network will only be as good as the local links, Sazegari said. "The transmission quality goes to hell when it goes through the local network," he said.

The MCI portion of the network is capable of handling transmissions at 9.6K bit/

sec, but the company is guaranteeing customers delivery rates of only 4.8K bit/sec, saying speeds will depend on the quality of local lines connecting devices to the MCI network, Price said.

MCI's facsimile network will also help communications managers bring facsimile under centralized control. It will allow communications managers to set limits on areas to which a facsimile machine can transmit and give them detailed traffic information, including time, date and destination of traffic, Price said.

Users will also benefit by having access to enhanced facsimile services at a relatively low cost, Price said. Users will be billed only for transmission time. There is no monthly subscription charge. All protocol conversion, delivery notification, billing and management reports are provided at no extra cost, he added. **E**

Networks put railroads on track

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It will also allow dispatchers to ensure that trains meet at the correct times. If the system detects that one of two trains scheduled to meet at a designated location will be 20 minutes late, it can instruct the other train to slow down accordingly, thereby saving fuel.

Plus, the dispatcher does not have to rely on the engineer to acknowledge all the traffic signals. Should an engineer for some reason ignore the warnings generated by ATCS, a dispatcher can make the on-board workstation activate the brakes.

"In 1986, we had an engineer acknowledge three restrictive signals and run into the rear end of a train ahead of him at 30 mph when he should have been stopped over a quarter mile away," Young said.

There is an industry effort under way, supervised by the Association of American Railroads and the Railway Association of Canada, for a standardized ATCS. The standard would make it possible for one rail company to retain control even when its trains pass onto tracks owned by other operators. Young said the specifications for the standard should be completed by the end of the year.

Burlington Northern, however, decided not to adhere to the standard. Its satellite-based ARES system is more cost-effective than ATCS because the reception of satellite signals is free and there are no transponders to buy and maintain, said Edward Butt, director of ARES.

The system, which is being installed by the Railroad Electronics Business Area of Rockwell International Corp., is being tested on 250 miles of track in northern Minnesota.

Each of the 17 locomotives involved in the test is equipped with a small antenna that sits on top of the cab. The antenna picks up signals from three or more of the seven Defense Department Navstar satellites currently in orbit. Six more satellites are expected to be launched this year and another six next year.

A processor on the trains uses the signals, which contain information regarding the time they were sent and the location of the satellite that sent them, to triangulate the train's location and speed to within 150 feet and 1 mph.

Other than using the satellite system for location and speed determination, Burlington Northern's network is similar to Union Pacific's.

Once the location is determined, the information is transmitted from the locomotives to ground terminal controllers, devices Rockwell designed to digitize radio signals and transmit them via fiber, microwave or leased lines to a dispatching office near Minneapolis.

In the locomotive's cab, two CRTs display a map of the train's route that shows crossings, hills and signals. This makes it easier for the engineer to operate the train at the proper velocity, Butt said, increasing fuel efficiency and safety.

An important aspect of the detailed location capabilities of both systems is that they let dispatchers change an engineer's instructions while the train is en route. When a customer calls in an order to pick up some box cars, a dispatcher can instruct the appropriate train to fill the order.

Union Pacific expects to finish testing ATCS next year and begin full implementation in 1990, Young said. Burlington Northern will make a decision early next year regarding when to start phasing in ARES, Butt said. **E**

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2. Mail Entry Form to: Communication Networks, "See The Communications World" Contest, P.O. Box 9171, Framingham, MA 01701-9171. Be sure to affix postage.
3. All entries must be received by midnight, November 15, 1988. Contest drawing will be held November 30, 1988. Communication Networks is not responsible for entries delayed, late, mutilated or lost in the mail. Odds of winning depend on the number of entries received. **Only one entry per person.** Entries become the property of Communication Networks.
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Wang files can be updated with voice, written notes

Electronic pencil and tablet, optional telephone handset allow users to freeze and revise data.

By John Cox
Senior Editor

LOWELL, Mass. — Wang Laboratories, Inc. last week introduced a product that lets microcomputer users annotate screen-displayed text and data files with voice messages and hand-written notes and share the resultant digital package with other personal computer users.

The Wang Freestyle consists of microcomputer software and hardware interfaces that support an electronic pencil and tablet and an optional telephone handset. With these components, users can freeze a computer screen of information and annotate it by writing on the tablet or by talking into the handset. Freestyle also lets users type their comments onto the captured screen via the computer keyboard.

Annotated screens can be combined and shipped to other Freestyle-equipped microcomputers over a network based on

Wang VS Office, the company's integrated office application for its VS minicomputers.

Once a screen is captured by Freestyle, users can pick up the handset and begin talking at any time, adding comments that can be accompanied by hand-written notes. The voice information is converted to digital form and saved as a data file attached to the captured Freestyle screen, dubbed a "page."

Freestyle is designed to create an on-screen picture of the user's desk, according to the company. Stamp-sized screen images replicate Freestyle pages, which can be moved, stapled, unstapled, filed, mailed or enlarged for viewing or annotating.

Customers can use Freestyle without learning computer commands. They can create and work on pages simply by touching the stylus to the tablet, Wang said.

The system runs on Wang's own microcomputers or any oth-

er IBM Personal Computer AT-compatible microcomputer. The computer must be equipped with a Wang high-resolution monitor or a standard-resolution Hercules graphics-compatible monitor, a hard disk drive and at least 512K bytes of random-access memory.

The basic system, including tablet, tablet interface card, electronic pencil, software and cable, costs \$1,995. A voice interface card with handset, voice software and cable costs \$1,495. The facsimile interface with software costs \$1,595. A high-resolution HR100 monitor, controller and software costs \$3,910. The system will be available in January.

Despite the price, Stephen Levine, director of Wang's office user interface department, said the system is aimed at all types of users, not just top managers.

Data on the computer screen can be captured from a local microcomputer application or even a host application accessed through terminal emulation. In either case, Freestyle makes a copy of the screen without interacting with the application itself.

Wang Laboratories, Inc. is located at 1 Industrial Ave., Lowell, Mass. 01851, or call (508) 459-5000. □

GTE slaps Home Shopping Network with slander suit

GTE Florida countersuit seeks monetary award for HSN allegation that GTE blocked calls.

By Jim Brown
New Products Editor

TAMPA, Fla. — GTE Florida, Inc. last week sued Home Shopping Network, Inc. (HSN), charging the company with libel and slander for its claims that GTE mishandled telephone traffic, costing the television retailer \$500 million in lost revenue.

GTE Florida's countersuit was filed more than a year after HSN hit GTE Florida and GTE Communications Corp., both GTE Corp. subsidiaries, with a \$1.5 billion lawsuit ("HSN installs Rockwell gear," *NW*, Oct. 12, 1987).

The HSN suit alleged that GTE blocked calls to HSN, preventing customers from ordering merchandise featured on HSN's nationwide cable television program. Those blocked calls cost HSN \$500 million in lost sales and contributed to slowing the company's growth, HSN claimed.

GTE's countersuit denies those charges and seeks an unspecified amount of money from HSN for what GTE claims is libel and slander that have damaged its business reputation. GTE also alleges that HSN failed to prepare its telecommunications net for increased volume and that its legal action was an effort to blame its "recent poor market and financial performance" on GTE.

HSN alleges incoming customer calls were blocked at GTE Florida central office switches between March 1986 and May 1987. HSN further alleges that faulty GTE Omni switching equipment installed at HSN's order center by

GTE Communications Corp. also kept calls from reaching operators.

In its countersuit, GTE claims HSN inadequately planned for the large volume of calls it was receiving in order to avoid capital expenditures. GTE claims it and AT&T advised HSN as early as 1986 to revamp its telephone system to handle the larger volume of calls it was receiving.

GTE also says it told HSN that it would be better equipped to handle increased traffic if it bypassed GTE Florida's Tampa Bay central office and linked directly to an AT&T point of presence. GTE Florida said it made that recommendation even though it would have lost a large amount of operating revenue.

HSN revamped its network in May 1987 when it replaced GTE equipment with an on-site Rockwell Telecommunications, Inc. Specialized Communications Exchange tandem switch capable of accepting incoming AT&T 800 calls and passing them to three Rockwell Galaxy automatic call distributors. HSN has since switched to MCI Communications Corp. 800 services and has linked directly to MCI's point of presence.

HSN also installed an internally developed automated attendant that greets each caller with a prerecorded message. Repeat customers with HSN account numbers are prompted to directly enter orders from push-button keypads. Other callers wait on the line for an operator. □

BBN bolsters role of X.25

continued from page 1

will be able to reconfigure terminals and cluster controllers without shutting down portions of the SNA network and without the usual time-consuming system generation process, according to analysts.

In effect, the T/100 will make it possible to replace traditional SNA transport networks — dedicated multidrop lines supporting IBM's Synchronous Data Link Control protocol — with packet-switched facilities that offer the benefits of dynamic rerouting, easier network reconfiguration, built-in error correction and cost efficiency, analysts said.

The company is expected to eventually offer a channel-attached version of the T/100 that can support IBM's 3M-byte/sec mainframe channel speed. The device, which is supposed to offer high throughput, will be based in part on the communications processor BBN acquired with the purchase of Christian Rovsing a/s, formerly a subsidiary of Alcatel N.V. ("BBN profits from airline net business," *NW*, Aug. 15).

As initially announced, the T/100 will attach locally to a front end by one or more lines with a combined throughput of up to 256K bit/sec, analysts said. This speed is considerably higher than the 56K bit/sec that is most frequently used in packet networks.

The T/100 appears to an IBM host as an SNA Physical Unit 4 or 5, meaning IBM front ends — such as 3745s and 3725s — can communicate with the BBN box

using SNA protocols, said Jack Freeman, senior analyst for data communications at The Yankee Group, a Boston consultancy.

Remote sites that have cluster controllers but not hosts can access the X.25 backbone through packet assembler/disassemblers. SNA connections between hosts and local SNA devices will not change, analysts said.

Controllers supported by PADs still operate as if they are talking directly to an IBM 37XX.

"A user at a 3270 terminal — or at a PC emulating one — will have the ability through the T/100 to sign on to multiple IBM hosts that are geographically dispersed and run an application as if the hosts were collocated and exchanging data," Freeman said. "The network will virtually collocate the hosts, their data bases and their applications through the T/100."

This capability is likely to prove a boon to IBM SNA customers who are looking to X.25 as the means to build global data networks that can accommodate different brands of computers, according to analysts.

"The importance of the T/100 is going to be that it can bring multiple IBM hosts into a larger virtual network than has ever been [possible] before," Freeman said. BBN is not a Yankee Group client.

The T/100 will work with BBN's net management scheme, Network Operating Center, a centralized system that supports network monitoring in real time, troubleshooting, network configuration, managing a network data base, accounting and billing, according to BBN.

The SNA support offered by the T/100 will mesh well with the benefits of X.25-based packet nets, which are easier to configure and change than SNA nets, according to Eduardo Stecher, president of Communications Associates, Inc., a Natick, Mass., consulting group.

In the last few years, IBM has expanded and improved its support for X.25 networks. But analysts said these software products also degrade network performance. □

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NMI tallies third net mgmt. buy

By Paul Desmond
Staff Writer

FAIRFAX, Va. — Network Management, Inc. (NMI) last week announced its third buyout in the network management arena, saying it had acquired the Contel Network Analysis Center for an undisclosed amount.

NMI is following through on its strategy to acquire companies that can help it provide a complete line of network management tools. Backed by at least \$50 million in venture capital funding, NMI has acquired two other companies — CRC Systems, Inc. and Programmatic, Inc. — since its formation in 1986.

The acquisition of the Contel ASC subdivision, now known as the NMI Network Analysis Center, adds to NMI's product line the Network Analysis Center's Modular Interactive Network Designer (MIND) family of network design tools.

The MIND family consists of six software products that address the design of various types of networks, including data communications, multicarrier, packet-switched and multinode voice nets. It also includes software products to help users maintain

tariff, inventory and network analysis information.

The acquisition brings NMI Chairman Howard Frank back in control of a company he founded. In 1970, Frank founded Network Analysis Corp., which became the Contel Network Analysis Center when Contel acquired it in 1980. Frank was kept on as president of Contel Information Services, where he remained until 1985.

His successor as president of that division was Michael Muntner, who left Contel in 1986 to become president of NMI, a post he still holds today.

The Network Analysis Center employs about 20 people, Muntner said. He would not say whether the company has been profitable in recent years, and no revenue figures were available. A Contel spokesman said the Network Analysis Center has been on the block since February.

With the acquisition, NMI now has five of the six products and services it intended to offer when it embarked on its hunt for acquisitions in 1987 ("Firm poised for buyout binge," *NW*, Feb. 23, 1987). CRC Systems offers station message detail recording reports, facilities management and network planning services, while Programmatic provides consulting services and systems engineering.

To provide the missing element — real-time data diagnostics — Muntner said NMI is considering the acquisition of some other company or developing the capability in-house. □

RBHCs cite massive losses

continued from page 2

a significant threat to their revenue base, some in the industry disagree. Critics point out that the estimated losses of the RBHCs represent only the additional revenue the telephone companies might make if alternative facilities did not exist, rather than real losses.

Both observers and RBHC officials say it is difficult to quantify bypass levels because customers are not required to report when they initiate bypass services. That means the RBHCs must calculate the level of bypass by taking the total number of licensed microwave, fiber or satellite facilities serving their region and using a rough determination of the amount of traffic that is likely carried over those facilities.

Because the RBHCs make assumptions about traffic levels and pricing, Page Montgomery, vice-president of Economics and Technology, Inc., a Boston-based research firm, said he believes the RBHCs have grossly overestimated losses due to bypass. In a report on bypass prepared for the National Association of State Utility Consumer Advocates, Montgomery concluded that the RBHCs are reporting losses of at least twice their actual levels.

Montgomery emphasized that he is not accusing the RBHCs of deliberately misleading regulators but said, "Obviously, when the [RBHCs] have the chance to

make estimates and have a choice between a higher or lower number, they will choose the higher one."

Another obstacle to accurately quantifying bypass is that a good definition of bypass does not exist. Montgomery said that as many as 70% of the cases defined as bypass by the RBHCs do not belong in that category. He said that a significant number of microwave facilities are used by public utilities, state governments and pipeline companies to connect sites not reached by the telephone network.

For example, microwave is often used to connect emergency telephones along state highways or to connect monitoring stations in wilderness areas for the National Park Service. Because the telephone network does not reach these areas, use of microwave or satellite cannot be considered in computing lost revenue, Montgomery said.

Brian Moir, counsel for the International Communications Association, agreed that the RBHCs have incorrectly defined a number of private-line services as service bypass. Many data and video services now used by large corporations could not be handled on lower bandwidth, voice-grade switched circuits, he said.

Moir suggested that the RBHCs may be inflating bypass figures to show regulators that the local exchange market is subject to increasing competition and therefore should be less strictly regulated. □

Calendar

Nov. 28-Dec. 1, Hollywood, Fla. — GLOBECOM '88. Contact: IEEE Globecom '88, c/o Southern Bell, 6451 N. Federal Highway, P.O. Box 5567, Fort Lauderdale, Fla. 33310.

Nov. 29-30, Los Angeles — Telecommunications Technologies. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Lakeview, N.J. 07015, (201) 478-5400.

Nov. 29-Dec. 1, Washington, D.C. — National Connectivity Symposium. Contact: Digital Consulting, Inc., 6 Windsor St., Andover, Mass. 01810, (508) 470-3880.

Nov. 29-Dec. 1, Dallas — UNICOM 2 Expo and Conference: Building Bridges to the Integrated World. Contact: North American Telecommunications Association, 2000 M St., Washington, D.C. 20036.

Nov. 29-Dec. 2, McLean, Va. — OSI Product Integration Conference. Contact: Corporation for Open Systems, 1750 Old Meadow Road, McLean, Va. 22102.

Nov. 30-Dec. 2, Key Biscayne, Fla. — The 1988 Small Business/Home Office Market Conference. Contact: CAP International, Inc., One Longwater Circle, Norwell, Mass. 02061.

Dec. 1-2, Washington, D.C. — Understanding Telecommunications Technologies for Non-Engineers. Contact: TeleStrategies, Inc., 1355 Beverly Road, McLean, Va. 22101, (703) 734-7050.

Dec. 5-6, New York — T-1 Networking. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521, (800) 227-1234.

Dec. 5-7, Seattle — Data Communications I. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075, (800) 328-2776.

Dec. 8-9, Toronto — Preparing for ISDN: Business Implications of a Technical Revolution. Contact: Angus TeleManagement Group, Inc., 1400 Bayly St., Pickering, Ont. L1W 3R2, Canada, (416) 420-5050.

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Vendor pull warps wire standard

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nies, wiring manufacturers and computer and communications equipment vendors such as AT&T, IBM and DEC.

In its draft of horizontal wiring standards, the EIA recommended using two outlets at each work location, with the first outlet supporting telephones using four-pair unshielded twisted-pair cabling.

The second outlet, designated for use with communications and computer gear, would be supported by one of three types of wire: the four-pair unshielded twisted pair used by AT&T in its Premises Distribution System (PDS), the two-pair shielded twisted pair specified in the IBM Cabling System, and the coaxial cable DEC uses in its DECconnect system. The user would be responsible for deciding which of the three types to choose for the second outlet.

Vendors have an interest in pushing their preferred wiring systems. Once their equipment has been installed and their wiring placed behind the walls, it becomes more expensive for a user to switch to another vendor's equipment, since the user would have to rewire. This gives vendors some control over the equipment current customers buy in the future.

But the subcommittee's decision not to pick a single type of wiring leaves users facing the problems a standard was supposed to have resolved, analysts said.

"The EIA, in its draft standards, has sold users down the river," said Geoffrey Tritsch, a principal of Wellesley Hills, Mass.-based Powers Tritsch & Associates, Inc., a communications consulting firm. "If you have a mixture of AT&T, IBM and DEC equipment and you have no standard

then DEC wouldn't have pushed the coax," Thaler said. "But if IBM is going to have their medium in there, DEC's going to want their medium too."

Thaler, though not HP's representative on the subcommittee, monitored the group's work as coordinator of HP's involvement in local network standards.

Although Hansson acknowledged that IBM and DEC pressured the subcommittee into including their wiring systems as options, he said he disagreed with the notion that users were somehow sold short. Of the 30 members on the subcommittee, a half-dozen were users, and they liked the plan, Hansson said.

Lee Haas, a senior engineer at IBM and IBM's representative on the subcommittee, said the account of IBM threatening to walk out "doesn't sound exactly right," but he defended the subcommittee's deci-

sion to offer users three choices for horizontal wiring.

Specifically, Haas said, users need a choice because shielded wiring is not as susceptible to electromagnetic interference and suffers less attenuation, or loss of signal strength, than unshielded twisted pair.

The subcommittee presented a draft of the standards here last week. According to Hansson, EIA members should vote on the standards by mid-1989.

Because the EIA has no power to enforce the standards, they are really no more than guidelines. In the end, how EIA members vote may make little difference.

"Almost every end user is going to pick the kind of cabling scheme that fits his requirements," IDC's Gold said. "Users are not really going to be constrained by what someone calls a standard." □

Fibronics unveils trio of FDDI net products

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Fibronics will have the FDDI market to itself for at least the next two months. Bert Williams, AMD's strategic marketing manager for high-end networking products, said the Sunnyvale, Calif.-based semiconductor manufacturer would not be shipping the SuperNet chipset to other manufacturers in volume until the end of the year.

Although AMD has about 50 other beta test sites for its SuperNet chipset, "Fibronics was our primary beta test site," Williams said. "They paid the R&D price and bore all the early risks. Therefore, AMD is committed to supplying Fibronics with silicon before we begin shipping SuperNet in volume to the rest of the industry." □

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“The EIA has sold
users down the river.”



universal wiring plan that all three vendors will accept, you cannot wire a building once and know that you can support any device in any location in the building.”

The fact that users have three options means there really is no standard, some analysts say. "Just because someone calls something a standard, does that make it a standard? I have to be part of that crowd that says 'no,'" said Doug Gold, manager of Framingham, Mass.-based International Data Corp.'s communications industry research programs.

Gold said four-pair unshielded twisted pair, used in AT&T's PDS, would make an ideal universal wiring standard, because it is already widespread, takes up little room and "seems to be the least expensive."

In fact, Erik Hansson, chairman of the subcommittee and a member of Northern Telecom, Inc.'s scientific staff, acknowledged that the subcommittee leaned toward AT&T's PDS as a single standard until IBM resisted.

"Basically, that's what we tried to do [choose PDS], but IBM said they would walk out, and then DEC said they would too," Hansson said. "IBM feels very strongly about it."

Patricia Thaler, principal engineer for Hewlett-Packard Co., confirmed Hansson's account of the subcommittee's activity. "I suspect that if IBM had been willing to back down on the shielded twisted pair,

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